

Leslie
7379

Large Mining Operation

Worthen / Williams LLC
Roudabush #1 Mine / Quarry
DOGM NO M/45/0027

Submitted by:

Worthen / Williams LLC
2200 North 1200 West
Lehi, Utah 84043

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MAY 26 2016

Div. of Oil, Gas & Mining

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FOR YOUR HELP &
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Worthen / Williams LLC – Grantsville Quarry – LMO

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Worthen/Williams LLC – Grantsville Quarry – LMO

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R647-4 Large Mining Operations

R647-4-101. Filling Requirements and Review Procedures

This LMO is submitted to the Utah Division of Oil, Gas and Mining (DOGM) in compliance with part R647-4 of the Utah Minerals Reclamation program by Worthen / Williams LLC

The quarrying operation is located in Tooele County, Utah , on a 40 acre parcel

Owned by Worthen / Williams LLC. (Worthen/Williams). This site has now being mined, this is an updated request. This quarry is located in Sections 14 & 23 T4S, R6W.

R647-102. Duration of the Notice of Intention

It is understood that, this is an LMO update and remains in effect for the life of the mine. However Worthen/Williams acknowledges that the Division of Oil, Gas, and Mining (DOGM) may review the permit and require updated information and modifications when necessary.

R647-4-103. Notice of intention to Begin Large Mining Operations

Worthen/Williams's LMO addresses the requirement of the rules listed in this section as follows:

- 104. Operator(s), Surface and Mineral Owner(s)
- 105. Maps, Drawings, and Photographs
- 106. Operation Plan
- 108. Hole plugging Requirements
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- 110. Reclamation Plan.

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110.1 Current land use and post – mining land use-----

110.2 Reclamation of roads, highwalls, Slope. Leach Pads, Dumps, Etc----

Roads-----

Highwalls-----

Slopes & Quarry Floor-----

Impoundments, pits, and ponds-----

Drainages-----

Dumps, shafts, adits and leach pads-----

Drill holes

110.3 Surface Facilities to be left-----

110.4 Treatment, location, and Disposition of Deleterious Materials-----

110.5 Re-vegetation Planting program and topsoil Re-distribution-----

Soil Material Replacement-----

Seed Bed Preparation-----

Seed Mixture

Seeding Method

Fertilization-----

- Other Re-vegetation procedures-----

112 Variance

113 Surety

R647-4-104 Operator, Surface and Mineral Owner

1. Mine Name Roudabush Mine
2. Operator Worthen / Williams LLC
2200 North 1200 West
Lehi, Utah 84043
Phone – 801-768-3591
Fax 801-768-2684

Type of Business Corporation

Utah Business Entity # 2052237-0160

Local Business License # 2015-2016-211

Issued by: Lehi City

3. Permanent Address: Worthen / Williams
2200 North 1200 West
Lehi, Utah 84043
Phone – 801-768-3591
Fax – 801-768-2684

Registered Utah agent: Robert Worthen

Address (same as above)

4. Contact Person for Permitting Surety Notice
Dustin Phillips
Bank of American Fork
PO Box 307
American Fork, Utah 84003

5. Location of Operation: T4S, R6W, Section 14 & 15
6. Ownership of Land Surface Worthen Williams LLC
2200 N 1200 W
Lehi, Utah 84043
7. Owner of Record of Mineral to be Mined:
Worthen Williams LLC
8. BLM Lease or Project File Number:
None
9. Adjacent Land Owners: Connie Killpack
432 Quirk St.
Grantsville, UT 84029

Eddie C. Roberts
360 W Apple St
Grantsville, UT 84029

Bureau of Land Management
2370 S 2300 W
Salt Lake City, UT 84119
10. Have the land, mineral, and adjacent owners been notified in writing?
No.
11. Does Permittee/Operator have a legal right to enter and conduct mining operation on the land
Covered by this Notice? Yes.

R647-4-105. Maps, Drawings, and Photographs

Maps, drawings, and photographs are provided as requested on Form MR-LMO. The base map Checklist is referenced below by letters and parentheses (a,b,c,d,or e) that represents which of the bullet item is addressed on each map.

105.1. Base Maps: Figures 1 and 2

Figure 1 Base and mine location map and show the mine area and surroundings and is printed at a scale of 1'=2000'. It show streams, springs, water bodies, road, buildings, topography and utilities and required. There is no underground working on the site.

Figure 2 Land Ownership Map is printed at a scale of 1"=900' and shows the property boundaries, surface ownership of the mine and adjacent lands, and access routes.

105.2 Surface facilities maps: Figure 3

Figure 3: Existing Contours Map is printed at a scale of 1'=600' and shows existing surface facilities, roads and washes that pass through or near the land to be affected. There are no test borings, pits or boreholes. There is no overburden or waste rock, thus no storage areas are shown. No waste water is generated in the mine therefore, no discharge areas are shown. Storm water is not an issue at this site.

105.3 Reclamation Treatment: Figure 4

Figure 4 is a Reclamation Treatment map. This map is printed at a scale of 1'=600'. It shows details about reclamation treatment areas, including what disturbance, such topsoil stockpiles and roads, will be reclaimed. A border outlining the extent of the area to be reclaimed vs. the affected area is shown.

R647-4-106 Operation Plan

106.1 mineral to be Mined

The Roudabush mine will produce crushed silica for the purpose of manufacturing silica brick.

106.2. Type of Operation to be conducted.

Worthen Williams LLC Primarily extracts silica rock for transport to Utah Refractories Corporation for the manufacturing of silica brick (used in the production of glass products).

Mining Operation

The rock will be drilled for blasting and the shot rock moved by dozer and front end loader, then transported to Utah Refractories Corporation – Lehi, Utah.

Crushing Operation

Once the rock is removed from the working area, the material is brought a short distance to the jaw crusher by front end loader where it is broken down to 6-8" for initial sizing. It is then loaded into side dump trailers for transport to Utah refractories Corp – Lehi, Utah.

Blasting Practices

Blasting will be used in the mining process at the Roudabush Mine Grantsville Quarry. Blasting is not conducted by Worthen Williams LLC, but is subcontracted out to a qualified company trained in blasting design and practices. All blasting will be done in accordance with MSHA regulations. Unless needed, no seismic monitoring of blasting will be done at the Grantsville Quarry. Blasting has only occurred 2 times in the 15 year operation.

Concurrent reclamation

No reclamation is now taking place and no additional area is being disturbed.

106.3 Estimated Acreage

Approximately 5-7 acres will be disturbed over the life of the mine. This figure includes all access roads, storage piles, processing areas and mine areas.

106.4 Nature of material, including waste rock/overburden and estimated tonnage

Silica

The annual amount of silica generated is greatly dependent on annual demands. We are currently using another source of silica, so our current use is nil. Overburden is also used for road base and transported to plant refined and used.

106.5 Soils

Figure 3 Analytical sampling results are shown (fig 3 – 1 to 3-10) (fig 7) There is insufficient top soil. (see variance) Due to the lack of topsoil on the mining site, there was a variance issue. Attached please find a soil analysis of the 1/2" material. Soil analysis completed by NPI of Salt Lake City.

106.7 Existing vegetative communities to establish re-vegetation success..

The variance applies to the quarry area. Reclamation will be accomplished by using material generated as a result of the crushing process. This material will be 1/2" size and consist of silica, clay and whatever soil is present on the site. Attached is a soil analysis of the 1/2" material. Soil analysis completed by NPI of Salt Lake City. This material will be used to establish native vegetation. Lime and fertilizer will be added as needed.

106.8. Depth to Groundwater, Overburden material and Geologic Setting.

The closest well log was located for Water Right No. 15-3721 located N 76 ft., W 48 ft., from E4 cor. Sec 35, T 2S, R 5W SLBM. (approximately 1/4 mile from quarry) It was drilled at a surface elevation of approximately 4898 ft. Static water depth was 650 ft. The next closest Static Water Right No. 15-3471 located N 1671 ft., E 742 ft., from S4 cor. Sec 23, T 4S, R 6W, SLBM. Static water depth was 502 ft. It was drilled at surface elevation of 4866 ft. The quarry elevation is 4898 ft. indicating that ground water is not likely to be encountered. The depth to groundwater is well below the area of surface mining. (additional maps and wells are attached to the section. (see fig 7-1 thru 7-8)

R647-4-107 Operation Practices

All Operation Practices stipulated in R647-4-107 will be followed.

R647-4-108 Hole Plugging Requirements

Other than blast hole drilling, there are no plans for future drilling within the permit area for exploration

R647-4-109 Impact Statement

109.1 Surface and ground water systems

Surface Water – There is not significant amount of surface are involved to have an impact on any surface water (see attached water depth maps and wells)

109.2 Wildlife habitat and endangered species.

Maps in the Utah Conservation Database, located at <http://dwr.cdc.nr.utah.gov/ucdc/> indicate that the area does not contain any significant habitat for mule deer, elk, moose or pronghorn. The Utah Natural Heritage Program of the Division of Wildlife Resources did not list any know records of these species of concern on or within one mile of area. See attached Threatened, Endangered, and candidate Species of Tooele county, that could be present in the project area. (see figure 4 &5)

109.3 Existing soil and plant resources

See (figure 5 & 6

109.4 Slope stability, erosion Control, Air quality, Public Health and Safety

Slope stability would be extremely negligible.

Erosion control – The present erosion potential, and the erosion potential after mining, is slight to negligible. (additional information see figure 5 & 6)

Air Quality – Worthen – Williams LLC. will operate crushers with Temporary Relocation Permits obtained from the State of Utah, Division of Air Quality obtained on an as needed temporary basis.

Public Health and Safety – Worthen – Williams LLC. will minimize the hazards for public safety and welfare during operation. All trash and unwanted materials will be promptly removed from site and disposed of properly.

R647-4-110 Reclamation Plan.

See Attached Reclamation Plan

R647-4-112 Variance

Application for variance was applied for (see original file) (1980)

R647-4-113 Surety

Direct costs

1. Demolition and removal of structures	0.00
2. Backfilling, grading, and contouring	8,000.00
3. Revegetation (preparation, seeding	2,500.00
4. Subtotal Direct Cost	10,500.00

Indirect Costs

5. Mob/Demob	0.00
6. Contingency	1,500.00
7. Engineering Redesign	0.00
8. Main Office Expense	0.00
9. Project Management Fee	0.00
10. Subtotal Indirect costs	1,500.00

11. Total Cost 2015	12,000.00
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12. Number of years	5
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13. Escalation (factor 0.012)	144.00
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14. Reclamation Cost Escalated	1,644.00
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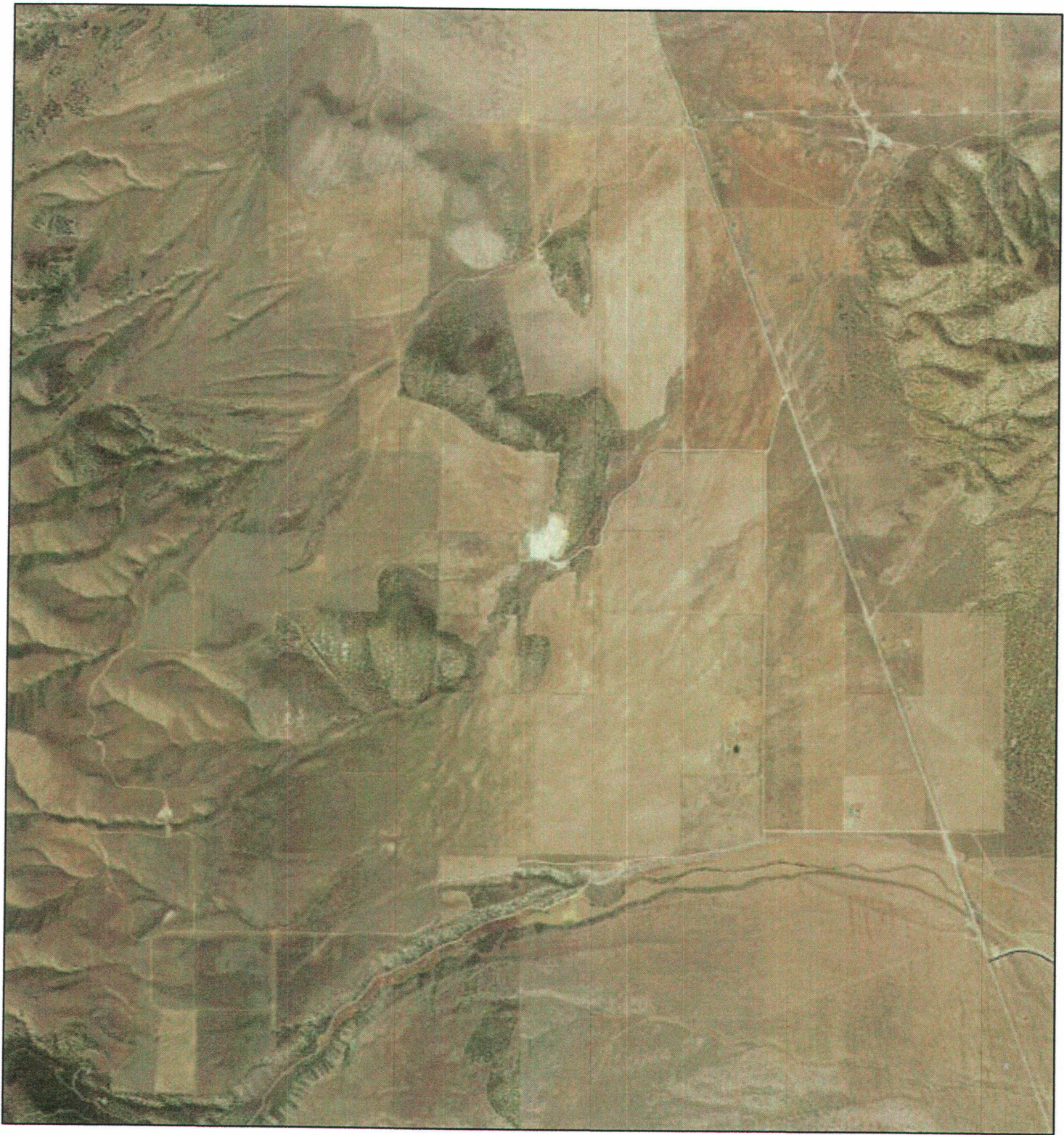
15. Per Acre Cost	2,400.00
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References

Utah Division of Water Rights, 2016 Water Right Record information. Available online at:
<http://maps.waterrights.utah.gov/EsriMap/map> Accessed May 2016

Utah Conservation Data Center 2016. Sensitive Species List by County. Available on line at:
<http://dwrcds.nr.utah.gov/ucdc/ViewReports/sscounty.htm> Accessed May 2016

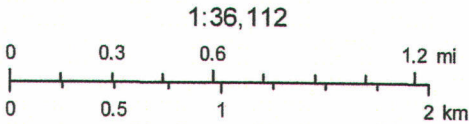
roudabush mine



April 13, 2016 *Figure 1*



Incorporated Municipalities



Tooele County GIS
AGRC
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus
DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the
GIS User Community

1



1



1



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1

Ecological Site Description
SCS-BLM Utah
September 1984

Site Number: D28A324U
Site Name: UPLAND SHALLOW LOAM
(Pinyon-Juniper)

Habitat Type: JUOS/PIMO/ARARN

I. Physical Characteristics

A. Physiographic Features

1. This site occurs on foothills, rolling hills, stony ridges, canyon sides, fairly steep mountain slopes, and highly dissected pediments.

Slopes are mostly 10 to 40 percent.

Elevations range from 1,450 meters (4,800 ft.) on NW aspects to 2,400 meters (8,000 ft.) on NW aspects.

B. Soils

1. Characteristic soils in this site are 25 to 50 cm deep over bedrock and somewhat excessively drained.

They formed in colluvium and residuum derived mainly from limestone and chert parent materials.

The soils of this site are medium textured, moderately or moderately rapidly permeable soils containing more than 35 percent rock fragments, usually pebbles or cobbles. These soils are generally very strongly calcareous with more than 40 percent carbonates. Runoff is rapid or very rapid and hazard of water erosion is severe or very severe. Available water capacity is 1 to 5 cm (.5 to 2 inches).

The water supplying capacity is 2 to 12 cm. (1 to 5 inches). Average annual soil loss in potential is approximately 1 tons/acre. The soil surface factor (SSF) in potential is stable.

2. Soil taxonomic units representative of this site:

<u>Taxonomic Unit</u>	<u>Classification</u>	<u>Soil Survey</u>
LODAR Family	Lithic Calcixerolls, Loamy-Skeletal, Carbonatic, mesic	Millard County Western Part
Lundy GRV-L	loamy-skeletal, carbonatic, frigid lithic calcixerolls	Box Elder County Western Part
Lodar GRV-L	loamy-skeletal, carbonatic, mesic Lithic calcixerolls	Box Elder County, Western Part

Site Number: D28A324U
 Site Name: UPLAND SHALLOW LOAM
 (Pinyon-Juniper)

3. Other soils presently grouped into this site:

<u>Taxonomic Unit</u>	<u>Classification</u>	<u>Soil Survey</u>
	N/A	

C. Climate Features

1. Average annual precipitation is 30 to 40 cm (12 to 16 in.).
 Approximately 70 percent occurs as rain from May through October.

On the average, July, Sept., Jan-Feb. are the driest months and
 April - Jun. are the wettest months.

The mean annual air temperature is 43 49° Fahrenheit and the
 soil temperatures are in the mesic regime.

The average freeze-free period is 80 to 150 days.

The climate of this site is characterized by cold snowy winters and hot, dry
 summers with some fall precipitation occurring in Oct - Nov. This site may
 also receive summer precipitation in the form of thunderstorms as a result of
 orographic effects from nearby mountain ranges

In average years, cool season grass begin growth around May 15 and end growth
 around October 15.

D. Potential Natural Plant Community

1. The dominant aspect of the plant community is an open stand of
 Utah Juniper and some Pinyon Pine. The composition by air-dry
 weight is approximately 50-60 percent grasses, 3-5 percent forbs
 and 40-50 percent shrubs.

2. Community Composition

<u>Plant Symbol</u>	<u>Common Name</u>	<u>Percent by weight (air-dry)</u>
<u>Grass and Grass like</u>		<u>(50 - 60)</u>
AGSP	Bluebunch wheatgrass	15 - 20
ORHY	Indian ricegrass	5 - 10
SIHY	Bottlebrush squirreltail	3 - 5
POA	Bluegrass species	10 - 15
PPGG	Other Perennial Grasses	5 - 10*
AGSM	Western wheatgrass	
STC04	Needleandthread	
KOCR	Prairie junegrass	
ELAMS2	Salmon wildrye	
IIJA	Galleta	
SPCR	Sanddropseed	
CAREX	Sedge	

Site Number: D28A324U
 Site Name: UPLAND SHALLOW LOAM
 (Pinyon-Juniper)

Forbs

(3 - 5)*

ASTER	Aster
ASTRA	Locoweed
SPHAE	Globemallow
CHAL7	Lambsquarter
CRYPT	Crypthantha
DEPI	Pinnate transymustard
ERIGE2	Daisy
ANTEN	Pussytoes
CASTI2	Indian paint

Shrubs

(40 - 50)

ARARN	Black sagebrush	20 - 25
PUTR2	Antelope bitterbrush	5 - 10
ARTR2	Big sagebrush	5 - 10
CHVI8	Douglas rabbitbrush	2 - 3
COME5	Mexican cliffrose	2 - 3
SSSS	Other shrubs	5 - 10*
EPHED	Mormontea	
CEMO2	Birchleaf mountain mahogany	
GUSA2	Snakeweed	
AMAL2	Saskatoon serviceberry	
OPUNT	Pricklypear	
CELEI2	Littleleaf mountain-mahogany	
ATCA2	Fourwing saltbush	

*Allow 2 percent maximum of each species in potential plant community.

3. Trees

<u>Plant Symbol</u>	<u>Common Name</u>	<u>Density (No./Ac.)</u>	<u>Percent Canopy Cover</u>	<u>Site Index</u>
JUUS	Utah Juniper	200/AC		
PIMO	Pinyon Pine	100.AC	60	32

4. Total Annual Air-Dry Production

	<u>Kg/ha</u>	<u>Lbs/Ac</u>
	Understory A11	Understory A11
Favorable years	785 1120	700 1000
Normal years	590 840	525 750
Unfavorable years	235 390	210 350

Site Number: D28A324U
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(Pinyon-Juniper)

5. Ground cover in potential is approximately 30 percent. Total canopy cover in potential is approximately 85 percent.

6. Density of major species (10% composition by weight)

<u>Common Name</u>	<u>No./Acre</u>
Utah snowberry	2,720
Black sagebrush	140
Pinyon pine	100
Juniper	210

7. Seral Communities

- a. Grazing disclimax. As ecological condition deteriorates due to over grazing, desirable grasses such as ~~PONE3~~ Nevada bluegrass and ~~POSE~~ Sandberg bluegrass, ~~AGSP~~ Bluebunch wheatgrass and some forbs and shrubs decrease while Utah juniper ~~JUOS~~, and pinyon pine ~~PIMO~~ and various undesirable forbs and shrubs such as ~~DEPI~~ mustards, ~~ARTRT~~ sagebrush increase.
- b. Fire disclimax. When the potential natural plant community is burned, Utah juniper, pinyon pine, sagebrush species, bitterbrush, mountain mahogany decrease while perennial grasses, Utah showberry, douglas rabbitbrush, increase.
- c. Cheatgrass brome, annual forbs are most likely to invade this site.
8. The above vegetation description is based on composition spread sheet data, D-28 range site description data and two UT-2 estimates in fair - good condition.
- E. Other sites that are commonly associated with this site include: Mountain Loam, Upland Shallow Hardpan, Upland Shallow Loam, Upland stony loam (low sagebrush).
- F. Location of typical example of this site: P# 14-4 Warm Springs Soil Survey.

Broad Series

Coale S. 7,
C 33/34

The Broad series consist of moderately deep, well drained, moderately slowly permeable soils on mountainsides. These soils formed in colluvium and residuum derived dominantly from quartzite and sandstone. Slopes are 30 to 60 percent. Elevation is 5,200 to 7,200 feet. Average annual precipitation is 16 to 19 inches, and mean annual temperature is 42 to 44 degrees F.

These soils are loamy-skeletal, mixed, frigid Calcic Argixerolls.

A typical pedon of Broad gravelly loam, 30 to 60 percent slopes. In an area of Reywat-Broad-Rock outcrop association, 30 to 60 percent slopes, about 2 miles east and 12 miles south of Aragonite, about 2,200 feet east and 600 feet south of the northwest of sec. 15, T. 35, R. 10 W.

A1--0 to 4 inches; dark brown (10YR 4/3) gravelly loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine, fine and common medium roots; 10 percent cobbles, and 20 percent pebbles on the surface, 10 percent cobbles and 20 percent pebbles in the horizon; mildly alkaline (pH 7.5); clear smooth boundary.

A2--4 to 14 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, fine and medium and few coarse roots; common very fine tubular pores; 10 percent cobbles and 20 percent pebbles; mildly alkaline (pH 7.5); clear wavy boundary.

Bt--14 to 23 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 3/4) moist; moderate fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine, fine and medium and few coarse roots; common very fine and fine tubular pores; common thin clay films; 15 percent cobbles and 35 percent pebbles; mildly alkaline (pH 7.7); clear wavy boundary.

Bk--23 to 36 inches; pale brown (10YR 6/3) very cobbly loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine, fine, and medium roots; few very fine tubular pores; 30 percent cobbles and 30 percent pebbles; strongly calcareous; carbonates are disseminated and coat rock fragments; moderately alkaline (pH 8.0); abrupt irregular boundary.

R--36 inches; fractured quartzite bedrock.

Bedrock is at a depth of 20 to 40 inches. Secondary carbonate is at a depth of 23 to 36 inches. The mollic epipedon is 10 to 20 inches thick.

A horizon: Value is 4 or 5 dry, 2 or 3 moist and chroma is 2 or 3. Clay content is 15 to 20 percent. Rock fragment content is 15 to 35 percent. Reaction is neutral or mildly alkaline.

Bt horizon: Value is 4 to 6 dry, 3 or 4 moist, and chroma is 3 or 4. Clay content is 27 to 35 percent. Rock fragment content is 35 to 60 percent. Reaction is mildly alkaline or moderately alkaline.

Bk horizon: Value is 5 to 7 dry, 4 or 5 moist and chroma is 3 or 4. Texture is very gravelly loam or very cobbly loam. Clay content is 15 to 20 percent. Rock fragment content is 35 to 60 percent. Reaction is moderately alkaline or strongly alkaline. Carbonate equivalent is 15 to 40 percent.

Reywat series

Tooele S.W.

C 86/87

The Reywat series consists of shallow, well drained, moderately slowly permeable soils on hillsides and mountainsides. These soils formed in residuum and colluvium derived dominantly from quartzite. Slopes are 30 to 60 percent. Elevation is 5,200 to 7,200 feet. Average annual precipitation is 12 to 16 inches, and mean annual air temperature is 45 to 52 degrees F.

These soils are loamy-skeletal, mixed, mesic Lithic Argixerolls.

A typical pedon of Reywat very cobbly loam, 30 to 60 percent slopes in an area of Reywat-Broad-Rock outcrop association, 30 to 60 percent slopes, about 16 miles south and 2 miles east of Dugway, about 2,900 feet east and 1,200 feet north of the southwest corner of sec. 36, T. 9 S., R. 8 W.

A--0 to 2 inches; grayish brown (10YR 5/2) very cobbly loam, very dark brown (10YR 2/2) moist; weak medium platy structure parting to weak fine granular; soft and very friable; many very fine, common fine, few medium and coarse roots; many very fine vesicular and tubular pores; 35 percent pebbles, 20 percent cobbles and 5 percent stones on the surface; 25 percent pebbles and 15 percent cobbles in the horizon; neutral (pH 7.2); clear smooth boundary.

Bt1--2 to 4 inches; grayish brown (10YR 5/2) very gravelly clay loam, very dark grayish brown (10YR 3/2) moist; weak coarse granular structure parting to moderate very fine subangular blocky; hard, firm, sticky and plastic; common very fine, fine and few medium roots; common very fine, fine and few medium pores; common thin clay films on faces of peds and in pores; 30 percent pebbles and 10 percent cobbles; neutral (pH 7.0); clear wavy boundary.

Bt2--4 to 11 inches; brown (10YR 5/3) very gravelly clay loam; dark brown (10YR 3/3) moist; moderate very fine subangular blocky structure; extremely hard, very firm, sticky and plastic; common very fine, fine and few medium and coarse roots; many very fine and common fine tubular pores; many thin and few medium clay films on faces of peds and in pores; 40 percent pebbles and 15 percent cobbles; neutral (pH 7.0); abrupt irregular boundary.

R--11 inches; hard fractured quartzite bedrock.

Bedrock is at a depth of 10 to 20 inches. The particle size control section is 35 to 60 percent rock fragments.

A horizon: Value is 4 or 5 dry, 2 or 3 moist, and chroma is 2 or 3. Texture is very cobbly loam or very gravelly sandy loam. Clay content is 10 to 20 percent. Rock fragment content is 35 to 60 percent. Reaction is neutral or mildly alkaline.

Bt horizon: Value is 5 or 6 dry, 3 or 4 moist and chroma is 2 or 3. Texture is very gravelly clay loam, or very cobbly clay loam. Clay content is 27 to 35 percent. Rock fragment content is 35 to 60 percent. Reaction is neutral or mildly alkaline.

Summit County

Common Name	Scientific Name	State Status
American Three-toed Woodpecker	Picoides dorsalis	SPC
Bald Eagle	Haliaeetus leucocephalus	SPC
Bluehead Sucker	Catostomus discobolus	CS
Bobolink	Dolichonyx oryzivorus	SPC
Bonneville Cutthroat Trout	Oncorhynchus clarkii utah	CS
Brown (Grizzly) Bear	Ursus arctos	S-ESA
Canada Lynx	Lynx canadensis	S-ESA
Colorado River Cutthroat Trout	Oncorhynchus clarkii pleuriticus	CS
Columbia Spotted Frog	Rana luteiventris	CS
Deseret Mountainsnail	Oreohelix peripherica	SPC
Ferruginous Hawk	Buteo regalis	SPC
Greater Sage-grouse	Centrocercus urophasianus	SPC
Lewis's Woodpecker	Melanerpes lewis	SPC
Northern Goshawk	Accipiter gentilis	CS
Northern Leatherside Chub	Lepidomeda copei	SPC
Short-eared Owl	Asio flammeus	SPC
Smooth Greensnake	Opheodrys vernalis	SPC
Western Pearlshell	Margaritifera falcata	SPC
Western Toad	Bufo boreas	SPC
White-tailed Prairie-dog	Cynomys leucurus	SPC

Tooele County

Common Name	Scientific Name	State Status
Allen's Big-eared Bat	Idionycteris phyllotis	SPC
American White Pelican	Pelecanus erythrorhynchos	SPC
Bald Eagle	Haliaeetus leucocephalus	SPC
Bobolink	Dolichonyx oryzivorus	SPC
Bonneville Cutthroat Trout	Oncorhynchus clarkii utah	CS
Burrowing Owl	Athene cunicularia	SPC
California Floater	Anodonta californiensis	SPC
Columbia Spotted Frog	Rana luteiventris	CS
Dark Kangaroo Mouse	Microdipodops megacephalus	SPC
Eureka Mountainsnail	Oreohelix eurekaensis	SPC
Ferruginous Hawk	Buteo regalis	SPC
Fringed Myotis	Myotis thysanodes	SPC
Grasshopper Sparrow	Ammodramus savannarum	SPC
Greater Sage-grouse	Centrocercus urophasianus	SPC
Kit Fox	Vulpes macrotis	SPC
Least Chub	Notichthys phlegethontis	CS
Lewis's Woodpecker	Melanerpes lewis	SPC
Long-billed Curlew	Numenius americanus	SPC
Lyrate Mountainsnail	Oreohelix haydeni	SPC
Northern Goshawk	Accipiter gentilis	CS
Northwest Bonneville Pyrg	Pyrgulopsis variegata	SPC
Preble's Shrew	Sorex preblei	SPC

Tooele County - continued

Common Name	Scientific Name	State Status
Pygmy Rabbit	<i>Brachylagus idahoensis</i>	SPC
Short-eared Owl	<i>Asio flammeus</i>	SPC
Southern Bonneville Springsnail	<i>Pyrgulopsis transversa</i>	SPC
Southern Tightcoil	<i>Ogaridiscus subrupicola</i>	SPC
Townsend's Big-eared Bat	<i>Corynorhinus townsendii</i>	SPC
Utah Phylla	<i>Phylla utahensis</i>	SPC

Uintah County

Common Name	Scientific Name	State Status
American Three-toed Woodpecker	<i>Picoides dorsalis</i>	SPC
American White Pelican	<i>Pelecanus erythrorhynchos</i>	SPC
Bald Eagle	<i>Haliaeetus leucocephalus</i>	SPC
Big Free-tailed Bat	<i>Nyctinomops macrotis</i>	SPC
Black-footed Ferret	<i>Mustela nigripes</i>	S-ESA
Bluehead Sucker	<i>Catostomus discobolus</i>	CS
Bobolink	<i>Dolichonyx oryzivorus</i>	SPC
Bonytail	<i>Gila elegans</i>	S-ESA
Brown (Grizzly) Bear	<i>Ursus arctos</i>	S-ESA
Burrowing Owl	<i>Athene cunicularia</i>	SPC
Canada Lynx	<i>Lynx canadensis</i>	S-ESA
Colorado Pikeminnow	<i>Ptychocheilus lucius</i>	S-ESA
Colorado River Cutthroat Trout	<i>Oncorhynchus clarkii pleuriticus</i>	CS
Cornsnake	<i>Elaphe emoryi</i>	SPC
Ferruginous Hawk	<i>Buteo regalis</i>	SPC
Flannelmouth Sucker	<i>Catostomus latipinnis</i>	CS
Fringed Myotis	<i>Myotis thysanodes</i>	SPC
Greater Sage-grouse	<i>Centrocercus urophasianus</i>	SPC
Humpback Chub	<i>Gila cypha</i>	S-ESA
Kit Fox	<i>Vulpes macrotis</i>	SPC
Lewis's Woodpecker	<i>Melanerpes lewis</i>	SPC
Long-billed Curlew	<i>Numenius americanus</i>	SPC
Mountain Plover	<i>Charadrius montanus</i>	SPC
Northern Goshawk	<i>Accipiter gentilis</i>	CS
Razorback Sucker	<i>Xyrauchen texanus</i>	S-ESA
Roundtail Chub	<i>Gila robusta</i>	CS
Short-eared Owl	<i>Asio flammeus</i>	SPC
Smooth Greensnake	<i>Opheodrys vernalis</i>	SPC
Spotted Bat	<i>Euderma maculatum</i>	SPC
Townsend's Big-eared Bat	<i>Corynorhinus townsendii</i>	SPC
White-tailed Prairie-dog	<i>Cynomys leucurus</i>	SPC
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	S-ESA

Ecological Site Description
SCS-BLM Utah
September 1984

Site Number: D28A324U
Site Name: UPLAND SHALLOW LOAM
(Pinyon-Juniper)

Habitat Type: JUOS/PIMO/ARARN

I. Physical Characteristics

A. Physiographic Features

1. This site occurs on foothills, rolling hills, stony ridges, canyon sides, fairly steep mountain slopes, and highly dissected pediments.

Slopes are mostly 10 to 40 percent.

Elevations range from 1,450 meters (4,800 ft.) on NW aspects to 2,400 meters (8,000 ft.) on NW aspects.

B. Soils

1. Characteristic soils in this site are 25 to 50 cm deep over bedrock and somewhat excessively drained.

They formed in colluvium and residuum derived mainly from limestone and chert parent materials.

The soils of this site are medium textured, moderately or moderately rapidly permeable soils containing more than 35 percent rock fragments, usually pebbles or cobbles. These soils are generally very strongly calcareous with more than 40 percent carbonates. Runoff is rapid or very rapid and hazard of water erosion is severe or very severe. Available water capacity is 1 to 5 cm (.5 to 2 inches).

The water supplying capacity is 2 to 12 cm. (1 to 5 inches). Average annual soil loss in potential is approximately 1 tons/acre. The soil surface factor (SSF) in potential is stable.

2. Soil taxonomic units representative of this site:

<u>Taxonomic Unit</u>	<u>Classification</u>	<u>Soil Survey</u>
LODAR Family	Lithic Calcixerolls, Loamy-Skeletal, Carbonatic, mesic	Millard County Western Part
Lundy GRV-L	loamy-skeletal, carbonatic, frigid lithic calcixerolls	Box Elder County Western Part
Lodar GRV-L	loamy-skeletal, carbonatic, mesic Lithic calcixerolls	Box Elder County, Western Part

FIGURE 6

Site Number: D28A324U
 Site Name: UPLAND SHALLOW LOAM
 (Pinyon-Juniper)

3. Other soils presently grouped into this site:

<u>Taxonomic Unit</u>	<u>Classification</u>	<u>Soil Survey</u>
N/A		

C. Climate Features

1. Average annual precipitation is 30 to 40 cm (12 to 16 in.). Approximately 70 percent occurs as rain from May through October.

On the average, July, Sept., Jan-Feb. are the driest months and April - Jun. are the wettest months.

The mean annual air temperature is 43 49° Fahrenheit and the soil temperatures are in the mesic regime.

The average freeze-free period is 80 to 150 days.

The climate of this site is characterized by cold snowy winters and hot, dry summers with some fall precipitation occurring in Oct - Nov. This site may also receive summer precipitation in the form of thunderstorms as a result of orographic effects from nearby mountain ranges

In average years, cool season grass begin growth around May 15 and end growth around October 15.

D. Potential Natural Plant Community

1. The dominant aspect of the plant community is an open stand of Utah Juniper and some Pinyon Pine. The composition by air-dry weight is approximately 50-60 percent grasses, 3-5 percent forbs and 40-50 percent shrubs.

2. Community Composition

<u>Plant Symbol</u>	<u>Common Name</u>	<u>Percent by weight (air-dry)</u>
<u>Grass and Grass like</u>		<u>(50 - 60)</u>
AGSP	Bluebunch wheatgrass	15 - 20
ORHY	Indian ricegrass	5 - 10
SIHY	Bottlebrush squirreltail	3 - 5
POA	Bluegrass species	10 - 15
PPGG	Other Perennial Grasses	5 - 10*
AGSM	Western wheatgrass	
STC04	Needleandthread	
KOCR	Prairie junegrass	
ELAMS2	Salmon wildrye	
IIJA	Galleta	
SPCR	Sanddropseed	
CAREX	Sedge	

Site Number: D28A324U
 Site Name: UPLAND SHALLOW LOAM
 (Pinyon-Juniper)

(3 - 5)*

Forbs

ASTER	Aster
ASTRA	Locoweed
SPHAE	Globemallow
CHAL7	Lambsquarter
CRYPT	Cryptantha
DEPI	Pinnate transymustard
ERIGE2	Daisy
ANTEN	Pussytoes
CASTI2	Indian paint

(40 - 50)

Shrubs

ARARN	Black sagebrush	20 - 25
PUTR2	Antelope bitterbrush	5 - 10
ARTR2	Big sagebrush	5 - 10
CHVI8	Douglas rabbitbrush	2 - 3
COME5	Mexican cliffrose	2 - 3
SSSS	Other shrubs	5 - 10*
EPHED	Mormontea	
CEMO2	Birchleaf mountain mahogany	
GUSA2	Snakeweed	
AMAL2	Saskatoon serviceberry	
OPUNT	Pricklypear	
CELEI2	Littleleaf mountain-mahogany	
ATCA2	Fourwing saltbush	

*Allow 2 percent maximum of each species in potential plant community.

3. Trees

<u>Plant Symbol</u>	<u>Common Name</u>	<u>Density (No./Ac.)</u>	<u>Percent Canopy Cover</u>	<u>Site Index</u>
JUUS	Utah Juniper	200/AC		
PIMO	Pinyon Pine	100.AC	60	32

4. Total Annual Air-Dry Production

	<u>Kg/ha</u> Understory All	<u>Lbs/Ac</u> Understory All
Favorable years	785 1120	700 1000
Normal years	590 840	525 750
Unfavorable years	235 390	210 350

Site Number: D28A324U
Site Name: UPLAND SHALLOW LOAM
(Pinyon-Juniper)

5. Ground cover in potential is approximately 30 percent. Total canopy cover in potential is approximately 85 percent.
6. Density of major species (%10% composition by weight)

<u>Common Name</u>	<u>No./Acre</u>
Utah snowberry	2,720
Black sagebrush	140
Pinyon pine	100
Juniper	210

7. Seral Communities

- a. Grazing disclimax. As ecological condition deteriorates due to over grazing, desirable grasses such as ~~PONE3~~ Nevada bluegrass and ~~POSE~~ Sandberg bluegrass, ~~AGSP~~ Bluebunch wheatgrass and some forbs and shrubs decrease while Utah juniper ~~JUOS~~, and pinyon pine ~~PIMO~~ and various undesirable forbs and shrubs such as ~~DEPI~~ mustards, ~~ARTRT~~ sagebrush increase.
- b. Fire disclimax. When the potential natural plant community is burned, Utah juniper, pinyon pine, sagebrush species, bitterbrush, mountain mahogany decrease while perennial grasses, Utah showberry, douglas rabbitbrush, increase.
- c. Cheatgrass brome, annual forbs are most likely to invade this site.
8. The above vegetation description is based on composition spread sheet data, D-28 range site description data and two UT-2 estimates in fair - good condition.
- E. Other sites that are commonly associated with this site include: Mountain Loam, Upland Shallow Hardpan, Upland Shallow Loam, Upland stony loam (low sagebrush).
- F. Location of typical example of this site: P# 14-4 Warm Springs Soil Survey.

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2011 Harvey

12/11/89

Issue Analysis Labor-
atory 417 Makara Way
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Von Isaman 582-0144
Fax: 583-2945

Name	pH	soluble salts mmhos/cm	Saturation Percentage	% Sand Silt Clay			Textural Classification	SAR	% Course Fragments	
									3-10"	10"
Lehi Soil	7.07	.20	74	79	11	10	sandy loam	.4	0	0
Suitable Range										
good	6.0-8.4	0-4	25-80				sandy loam		0-15	0-3
poor			<25 or >80							

VEGETATION SURVEY OF TOOELE COUNTY QUARTZITE MINE SITE

September, 1989

By David Humphrey

Professional Qualifications

I am currently a graduate student in the PhD program of the Range Science Department at Utah State University and am engaged in research in plant competition. I have an M.S. degree in Biology/Plant Ecology from Idaho State University, and a B.S. in Botany from the University of Georgia. My research at Idaho State was on plant succession on sites in southeastern Idaho and involved quantifying vegetation and identifying plant species on sagebrush-grass sites. My work experience includes three summers of field work in vegetation sampling and plant species identification in southeastern Idaho for Idaho State University, and one summer as a Biological Technician with the Bureau of Land Management in Southern Idaho (Burley District) conducting field work for vegetation inventory. I have published two papers in scientific journals on my plant ecology research in southeastern Idaho (the journal Vegetatio, 1984 and Great Basin Naturalist, 1985). I have also done plant ecology and plant taxonomy field work in Georgia and North Carolina.

The Site and Vegetation Survey Methods

The site is located within a valley and consists of a low ridge rising less than one hundred feet in elevation above the surrounding terrain. The elevation of the site is approximately 5600 feet. The ridge runs

approximately north-south. The site is about 40 acres in size. The dominant vegetation in the valley and the foothills and lower slopes of the surrounding mountains is sagebrush-bunchgrass and juniper-sagebrush-bunchgrass.

The vegetation sampling method used was line intercept. Six one-hundred-foot transects were sampled, two on top of the ridge, two on the east facing slope, and two on the west facing slope. The six transects were positioned in the following way: One transect was on top of the ridge beginning about 100 yards north of the current mining activity and continuing north along the ridge top, and one transect about 50 yards east of this transect on the east slope. Because the slope due west of these two transects was disturbed by mining activity, a transect on the west slope was established about 50 yards west of the transect on top of the ridge and about 100 feet north of the top transect. The other three transects were established about 100 yards north of north end of the first transect on top of the ridge, with one of the transects on top of the ridge and the other two parallel to it, one about 50 yards to the east and the other about 50 yards to the west. The sampling was done on September 9, 1989.

Each plant species intercepting the transects was recorded continuously along the entire length of each 100 foot transect; portions of transects not intercepting vegetation were recorded as either rock, litter or bare ground. These data were summarized in two ways: using the continuous intercept along the entire length of the transects, and using the intercept at points at one-foot intervals along each transect. Estimates of percent cover based on each of these two methods are provided. In order to identify differences among the

ridge top, west facing and east facing slopes, percent cover was estimated separately for each of these areas, as well as for the site as a whole.

Results of Vegetation Survey

The results of the vegetation survey based on each of the two methods described above are summarized below. For the ridge top, east slope, west slope and site as a whole, the percent of ground surface occupied by litter, rock and rock fragments, bare ground, and vegetation is indicated. For the major plant species (those with cover of over 0.5 % of the total surface area), the percent of the total surface area occupied by that species is given. The four dominant species are indicated by the numbers 1-4. The names of all other species that appeared in the data, along with the complete scientific names of the major species are also listed. Identification of a few species was uncertain, mainly because of the season in which sampling was done. A few were identified to genus only. Uncertain identifications are indicated by "?".

Percent Cover

Line Intercept, One-foot Intervals Line Intercept, Continuous

	Top	East	West	Total	Top	East	West	Total
Litter	9.5	12.5	13.0	11.7	14.5	18.7	20.4	17.8
Rock	34.5	16.0	24.0	24.8	34.2	15.5	22.6	24.1
Bare ground	24.0	29.5	29.5	27.7	24.9	27.1	14.8	22.3
Vegetation	32.0	42.0	33.5	35.8	26.4	38.7	42.2	35.8
1. Utah juniper	16.0	35.0	10.5	20.5	7.2	32.6	10.1	16.6
2. Sandberg bluegrass	7.5	2.5	4.0	4.7	4.3	2.5	4.8	3.9
3. Bluebunch wheatgrass	10.0	0.5	1.0	4.0	8.5	0.6	0.7	3.3
4. Big sagebrush	0.5	2.0	5.0	2.5	0.7	1.6	3.6	2.0
Spring-parsley	4.5	0.0	1.5	2.0	2.7	0.0	1.6	1.4
Cheatgrass (an annual)	0.5	1.5	3.0	1.7	0.3	1.8	1.5	1.2
Pricklypear	2.0	0.0	3.0	1.7	1.5	0.1	1.4	1.0
Louisiana wormwood	0.5	0.0	1.5	0.7	0.2	0.0	1.4	0.5

Scientific and Common Names of Plant Species Encountered
(Nomenclature follows Welsh et al., 1987)

The Eight Major Species

- ✓ 1. Utah Juniper: Juniperus osteosperma (Torr.) Little.
- ✓ 2. Sandberg bluegrass: Poa secunda Presl.
- ✓ 3. Bluebunch wheatgrass: Elymus spicatus (Pursh) Gould (= Agropyron spicatum (Pursh) Scribn. & Sm.)
- ✓ 4. Big sagebrush: Artemisia tridentata Nutt.
- ? Spring-parsley: Cymopterus sp. Raf.
- Cheatgrass: Bromus tectorum L.
- Pricklypear: Opuntia polyacantha Haw.
- Louisiana wormwood: Artemisia ludoviciana Nutt.

"Trace" Species
(listed alphabetically)

- ? Arabis sp. L. Rockcress
- ✓ Balsamorhiza sagittata (Pursh) Nutt. Arrowleaf balsamroot
- Calochortus sp. Pursh Mariposa or Sego lily
- Chaenactis douglasii (Hook.) H. & A. Douglas dusty maiden
- ✓ Chrysothamnus viscidiflorus (Hook.) Nutt. Green rabbitbrush
- Crepis acuminata Nutt. Mountain hawksbeard

- ✓ Elymus elymoides (Raf.) Swezey (= Sitanion hystrix (Nutt.) J. G. Sm.
Squirreltail
- ? Allium acuminatum Hook. Onion
- Lithospermum ruderale Dougl. ex Lehm. Stoneseed
- ✓ Phlox longifolia Nutt. Longleaf phlox
- ✓ Stipa hymenoides R. & S. (= Oryzopsis hymenoides (R. & S.) Ricker) Indian
ricegrass
- ? Unknown mat-like plant

The two methods of data summarization did not differ greatly in the percent cover they indicated for litter, rock, bare ground and vegetation, and the dominance rank of the major species is the same based on each of the two methods. The continuous intercept method recorded more plant species, because it amounted to a larger sample size than did the other method. Because of this larger sample size, the percent cover values indicated by the continuous method can be considered to probably be more accurate.

There were some differences among the top of the ridge and the east and west slopes. The main differences were: there appeared to be somewhat less vegetational cover and proportionally more rock on the ridge top, and the cover of bluebunch wheatgrass was greater on the ridge top; sagebrush was more abundant on the west slope and least abundant on the ridge top; on the east slope, there was more Utah juniper and less pricklypear; the major forb species spring-parsley and Louisiana wormwood were absent from the east slope.

For the purposes of this survey, interest is primarily in perennial plant species. All plant species were considered in this sampling, but only one annual, cheatgrass was recorded. However, its cover was less than two percent, thus it contributed very little to the percent vegetational cover

that is presented. This annual species was included in these results because it is sometimes an important species on lands of this type.

Comments on Revegetation

The 70 percent revegetation requirement for the site would be 70 percent of 35.8 which is 25.1 percent. Because of the quantity of material that will be removed, when the site is reclaimed it may be flat rather than the hill that exists now. If this is the case, the entire site may be more like the flatter ridge top than the present total site as described in this survey. If so, vegetational characteristics of the ridge top as well as the total site should perhaps be taken in to consideration with respect to revegetation. Thus, the revegetation goals might require somewhat more bluebunch wheatgrass and somewhat less Utah juniper and sagebrush than the values given for the total site. (The elevation differences between a flat reclaimed site and the present site (less than 100 ft.) would have no impact on vegetation composition.) The revegetation goals should be to reestablish the four major species, Utah juniper, Sandberg bluegrass, bluebunch wheatgrass and big sagebrush in proportions similar to those on the present site (taking into account the ridge top as well as the total site if the reclaimed site is flat, as discussed above). I would also suggest that an attempt be made to reestablish, at low abundance levels, pricklypear and at least some of the forb species that were encountered in the survey. Although these species were of low abundance on the site, their complete absence from the reclaimed site would be a considerable difference from the original vegetation. No attempt

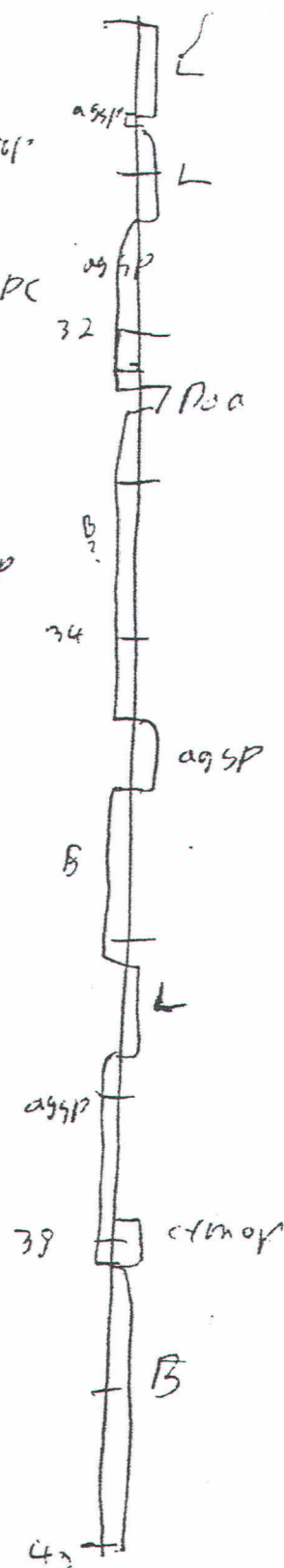
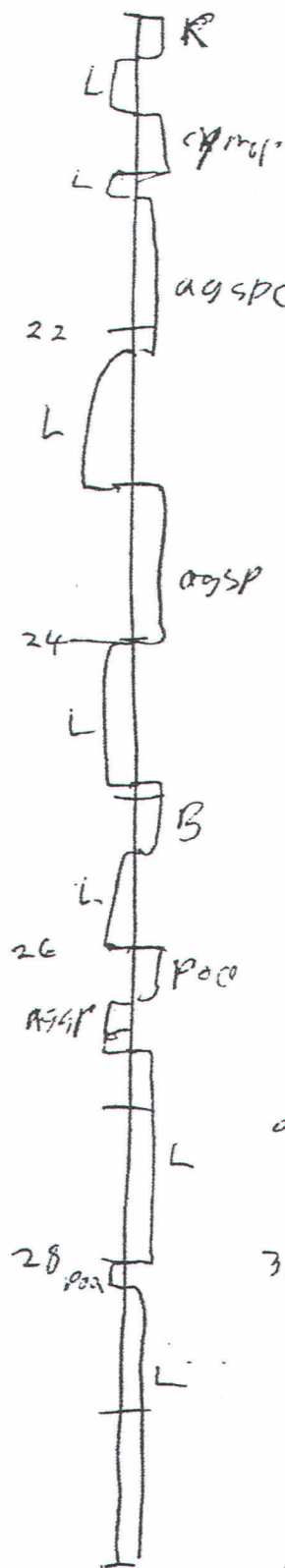
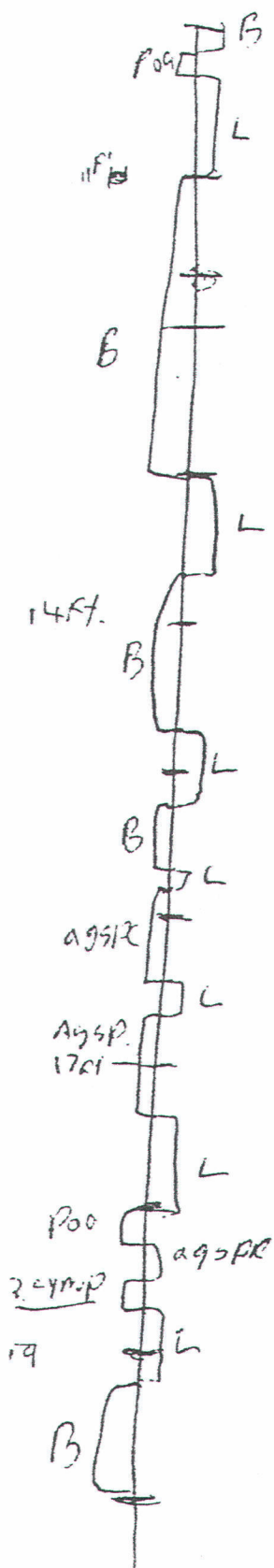
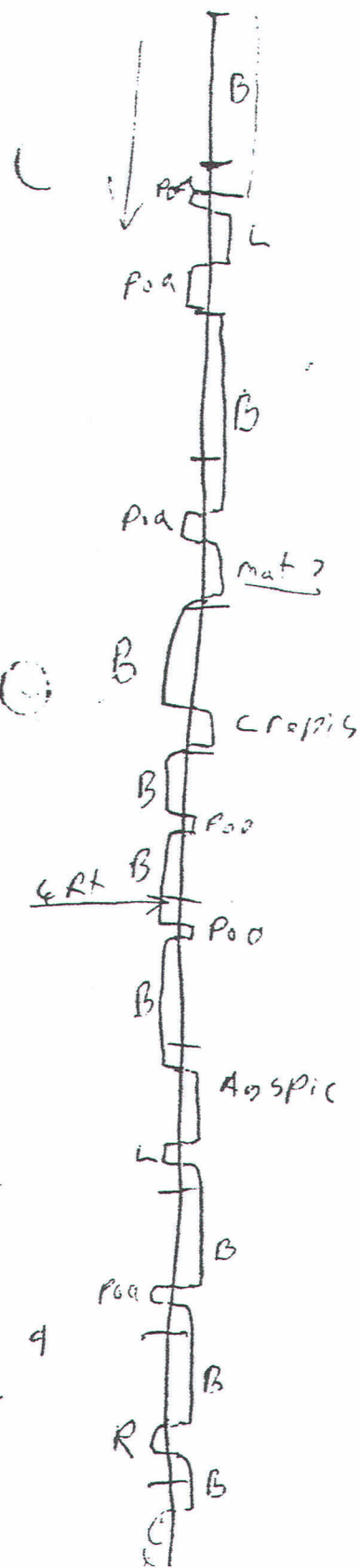
should be made to reestablish cheatgrass, because it is a non-native species, and because it is a weedy, easily established species that would likely become reestablished on the reclaimed site through natural means.

Literature Cited

Welsh, S. L., N. D. Atwood, L. C. Higgins and S. Goodrich 1987. A Utah Flora. Brigham Young University Press. 894 pp.

Continuous
Line in top cut
Line 1 : ~100m from road
S. end of Ridge

1-9-87



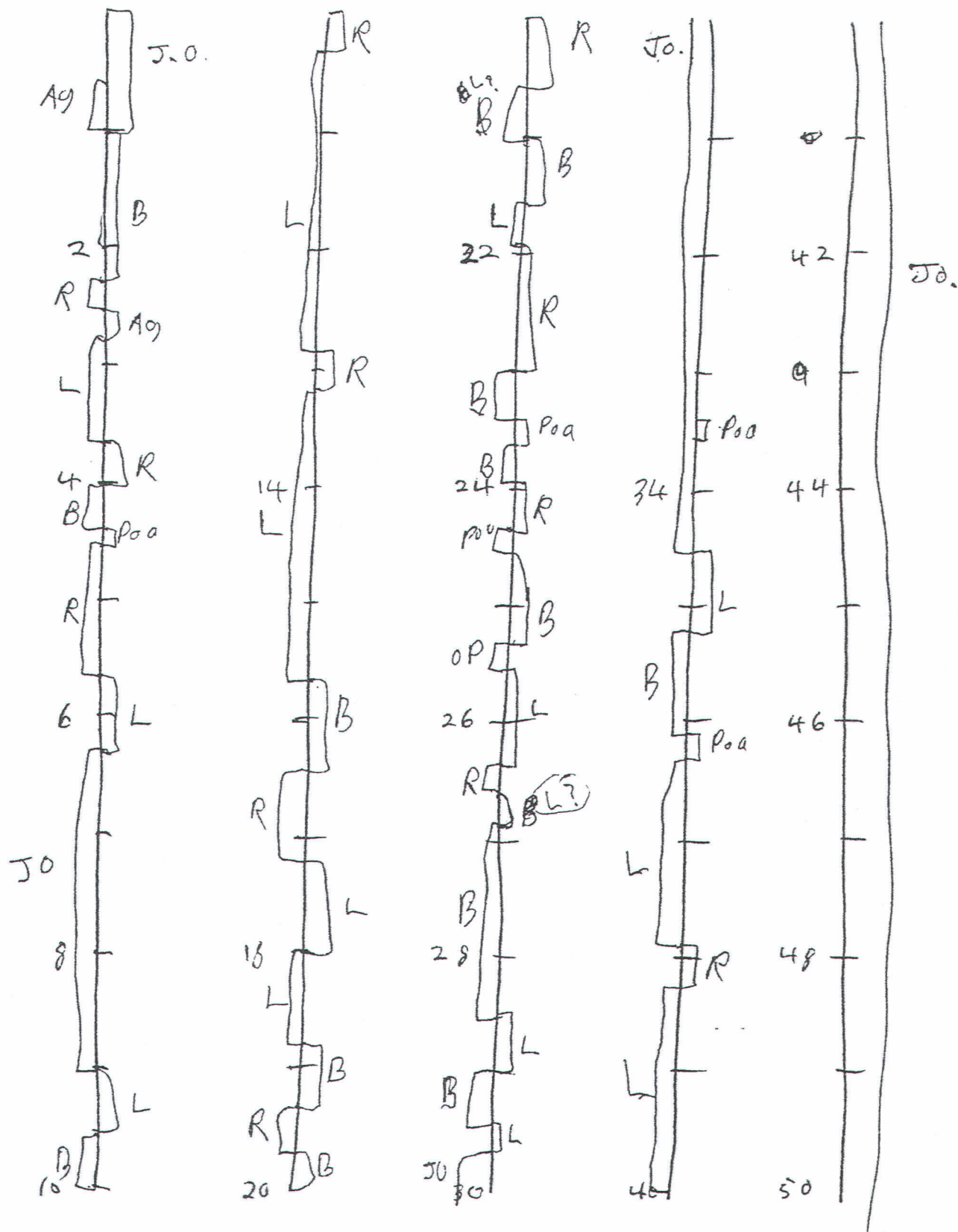
Line



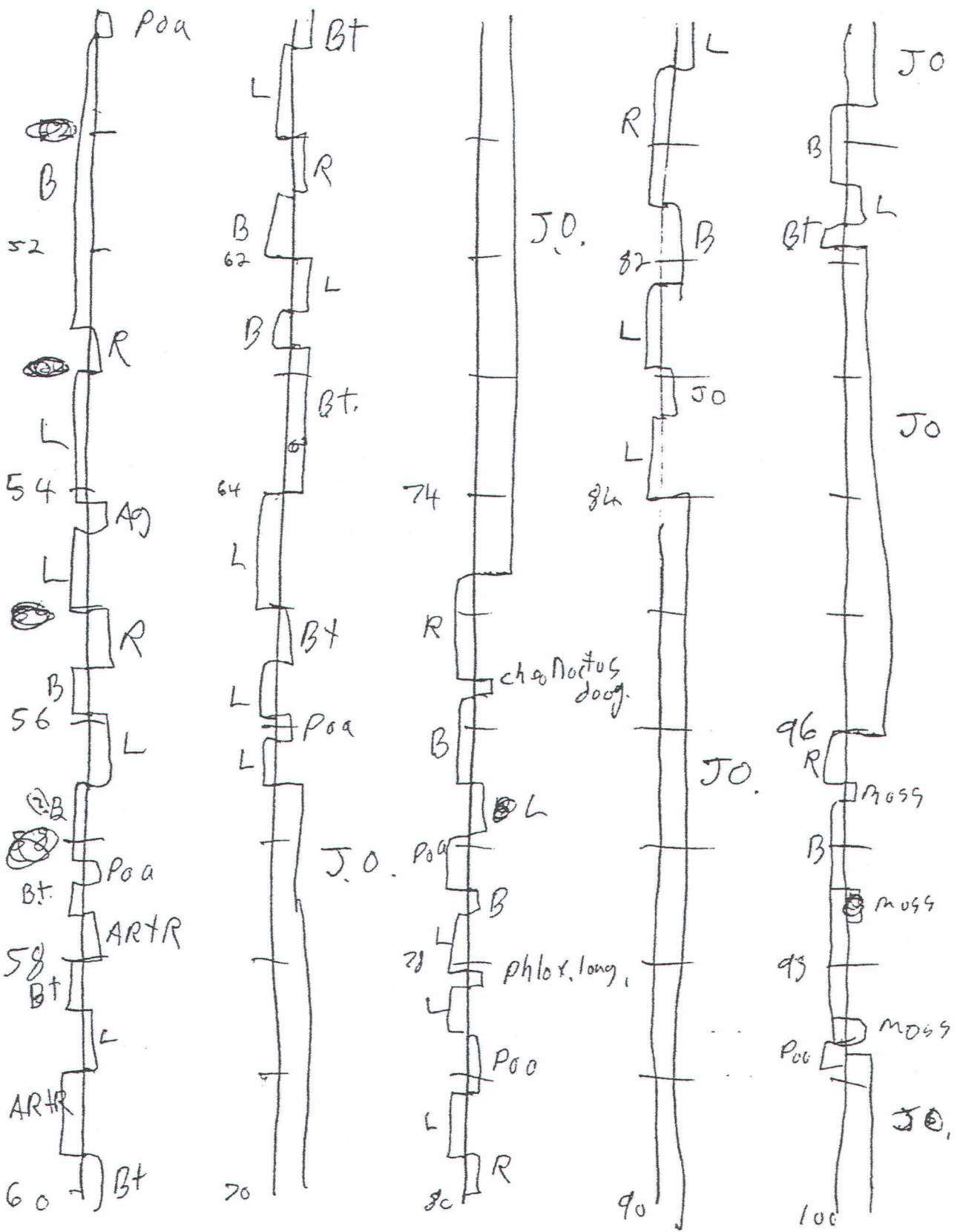
Line 2

(Boh. sag. , chert near)

9-9-89



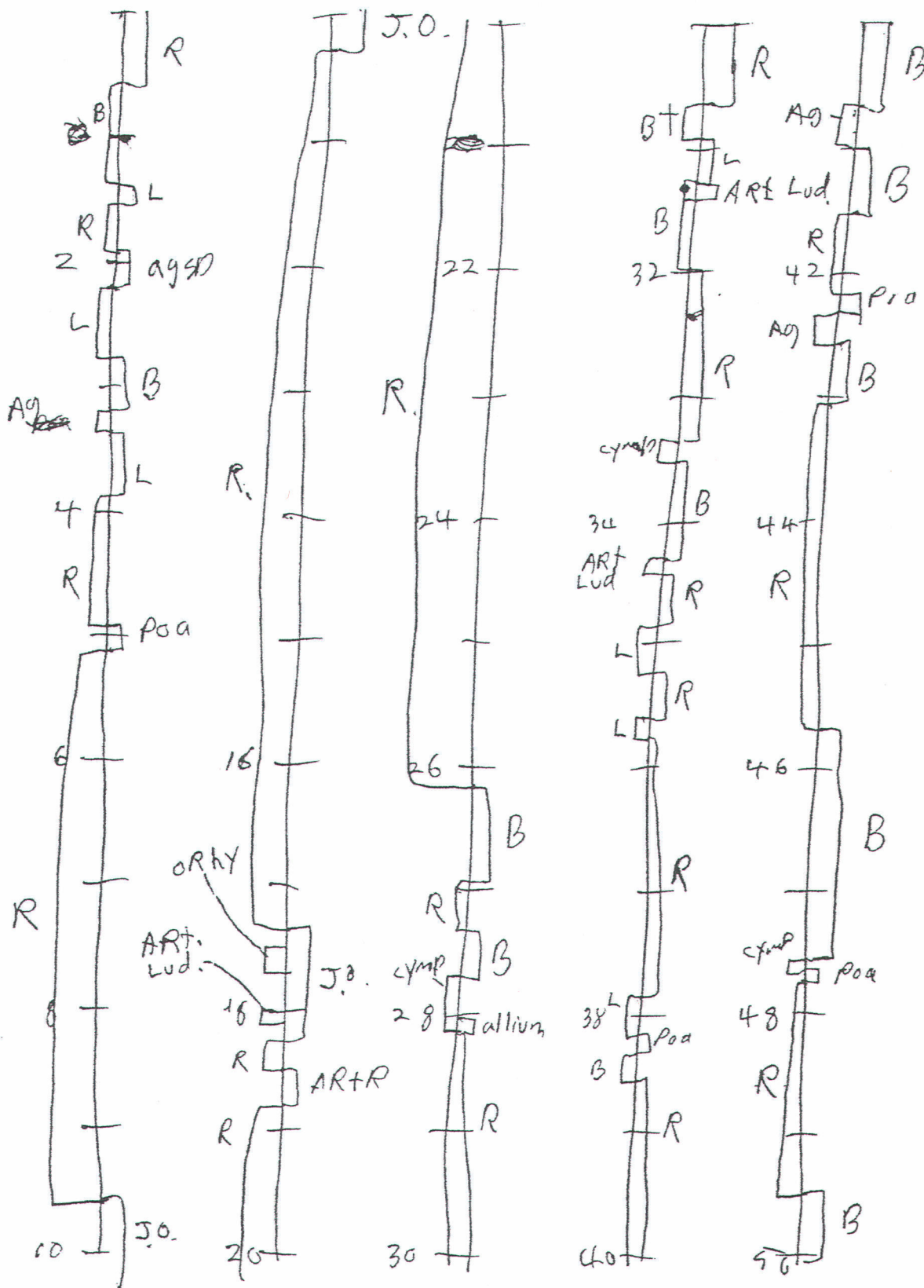
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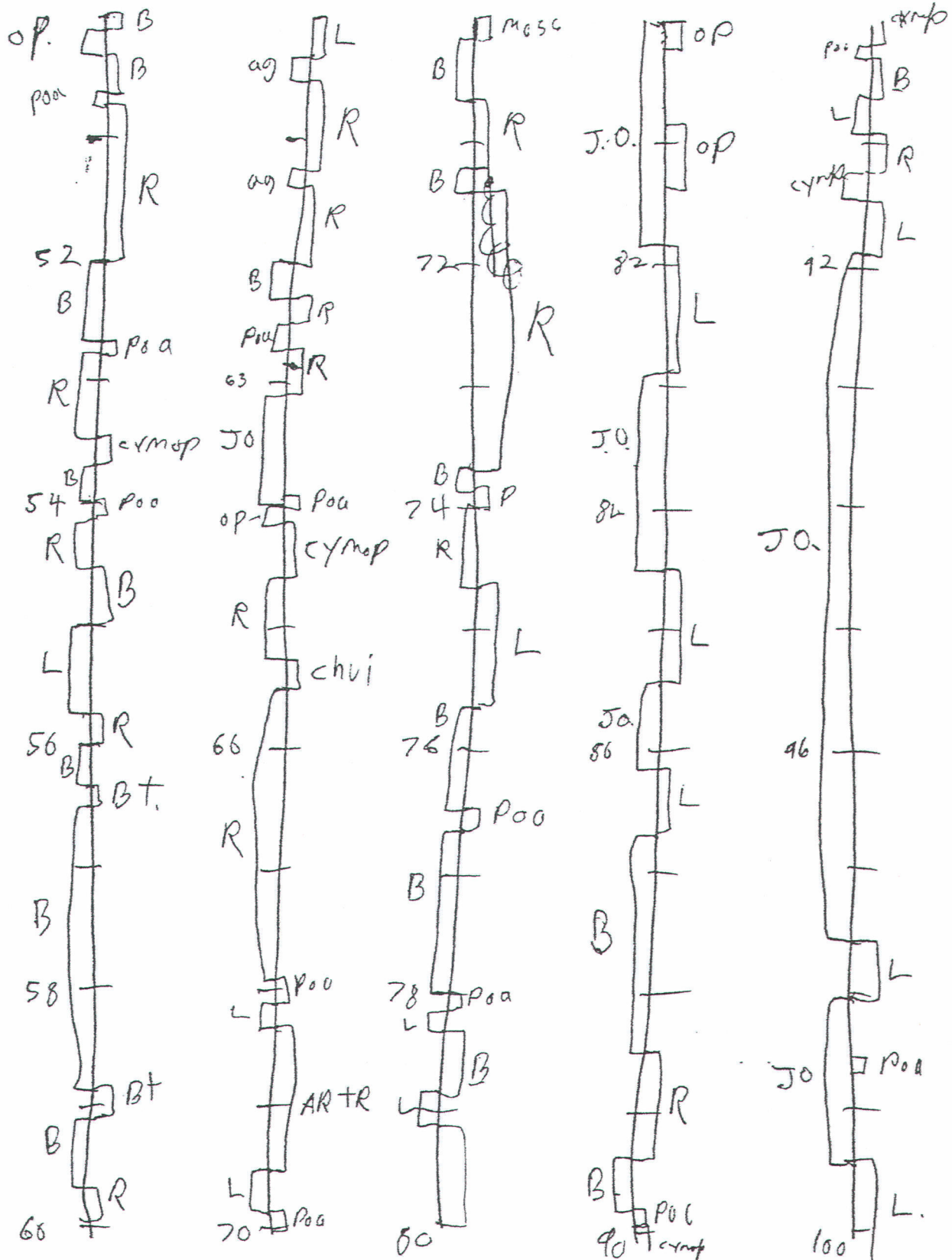
Line 3 (top)

A-4-84

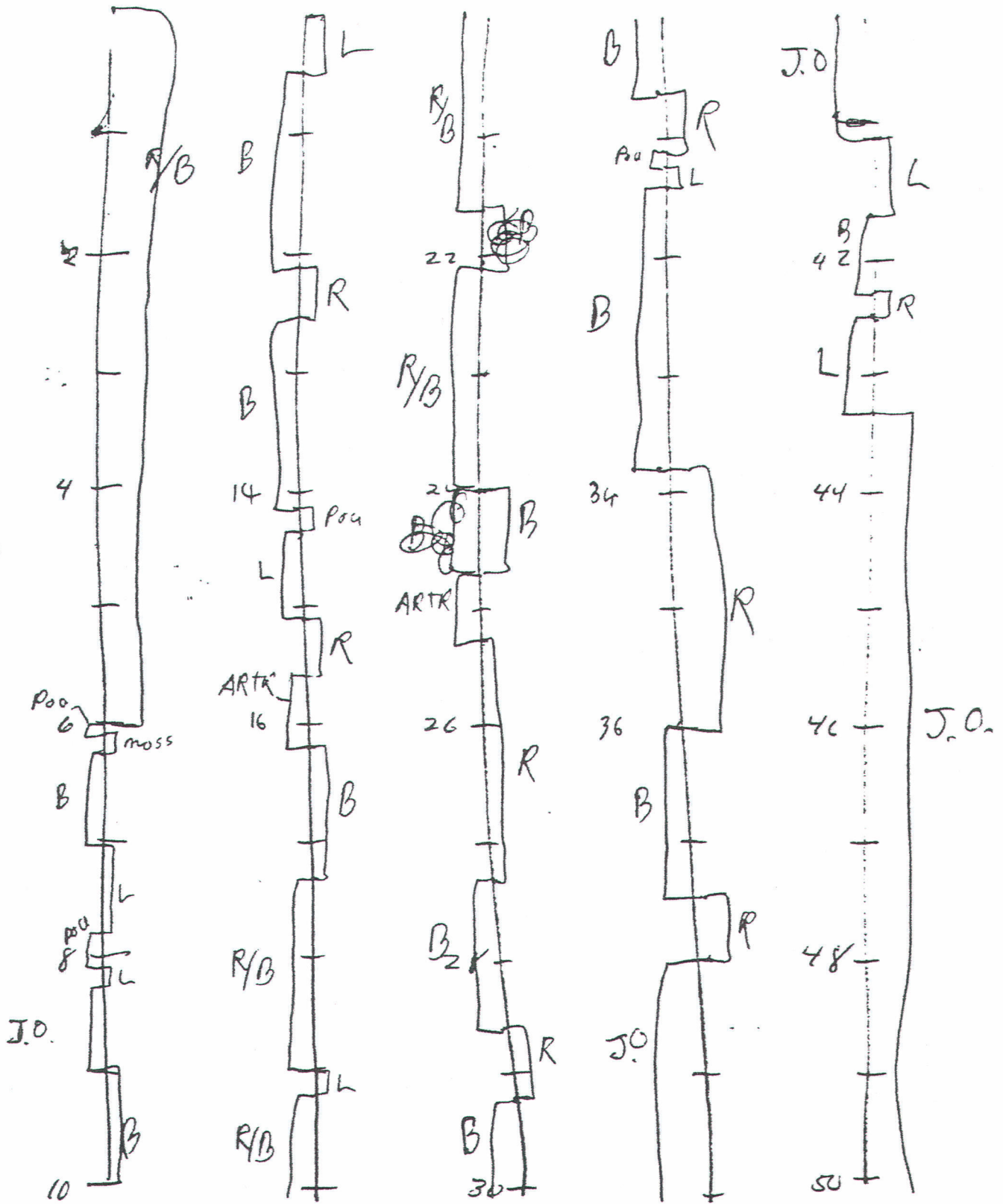
Hoplo nappos (?) near
(after ~~or~~ Orchidina) -
near of related



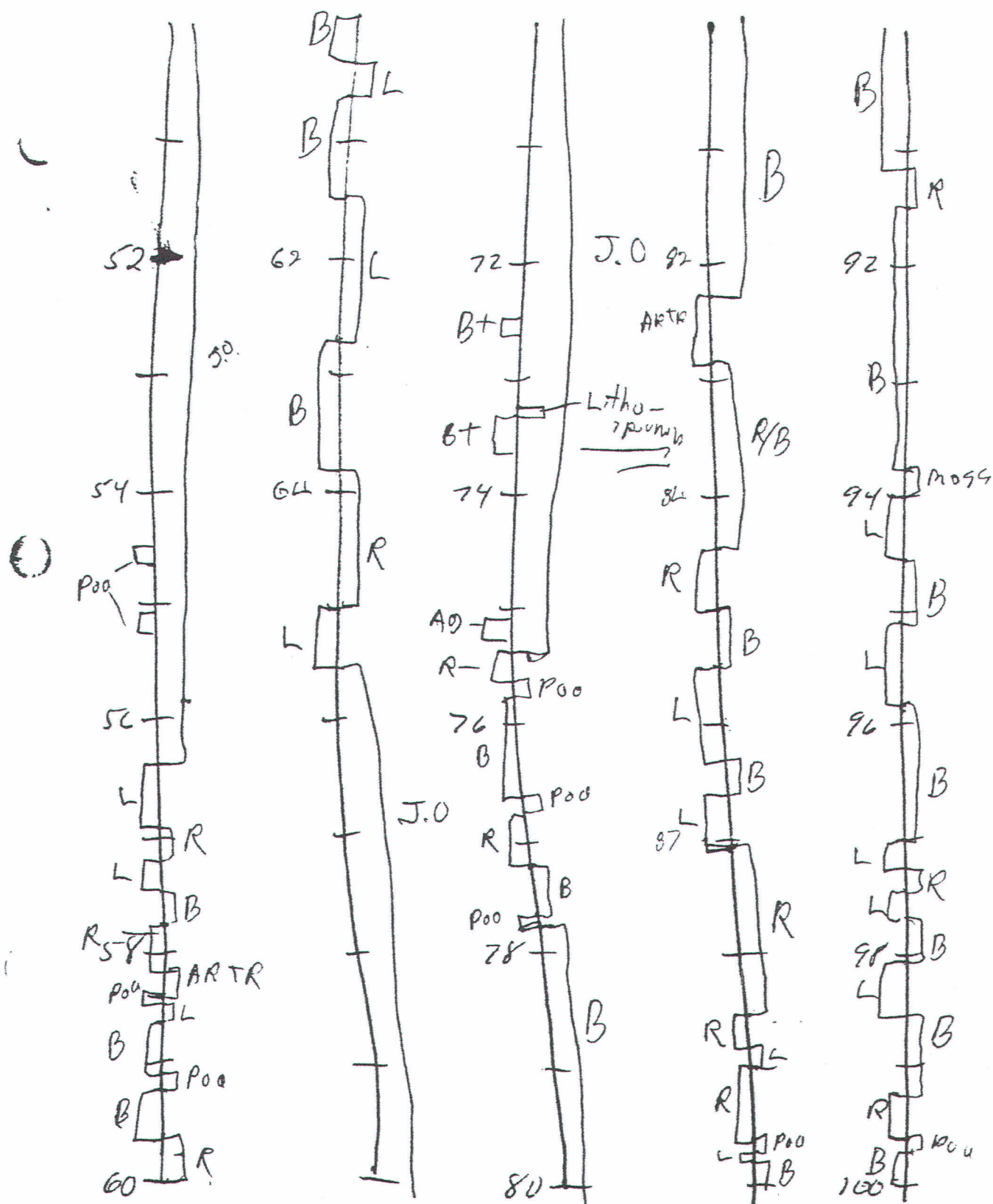
Line 3



Line 4 East)



Line 4



(must be
all over
year)

Line 6 (west)
bottom

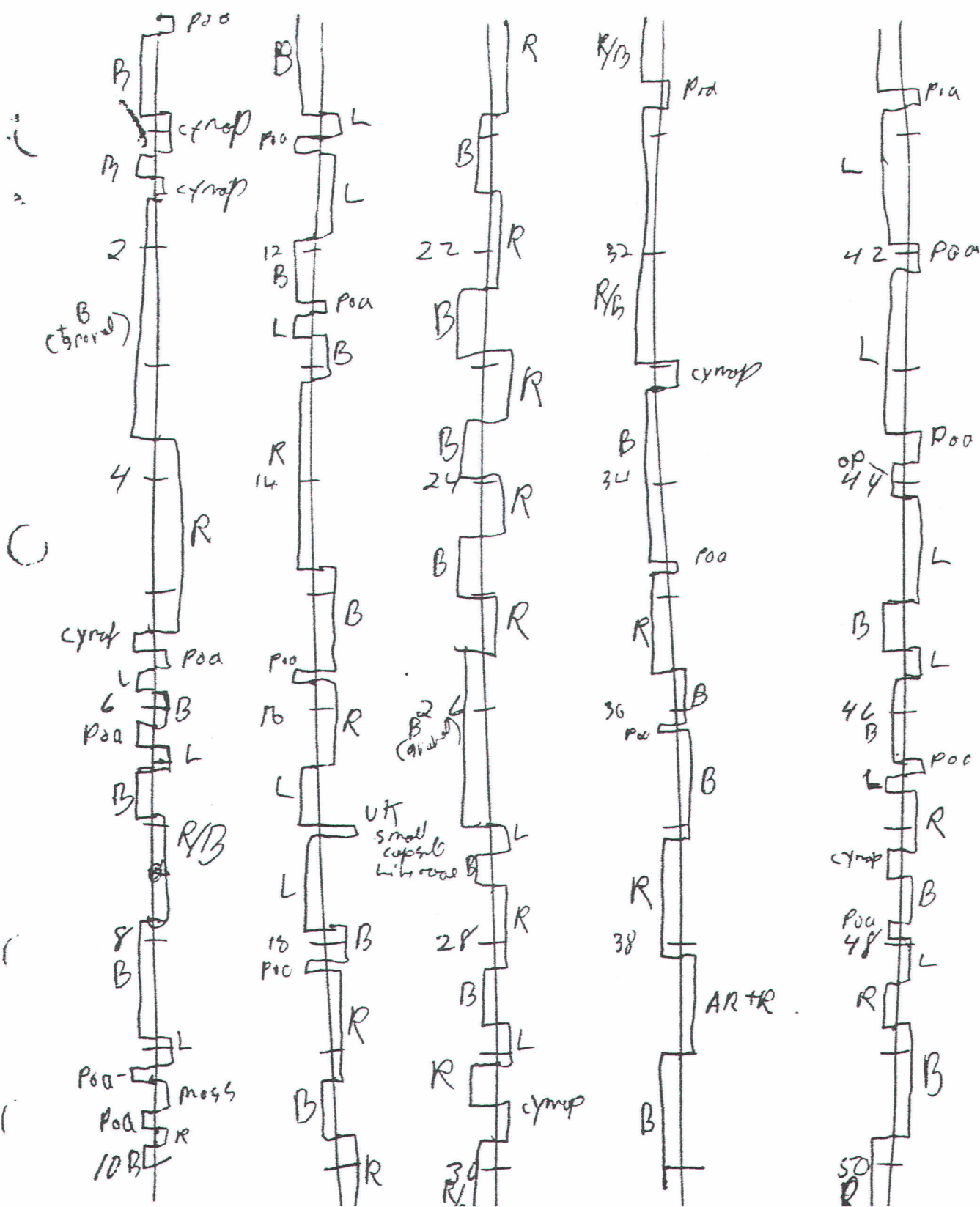
Between 1st and 2nd set of $\frac{1}{2}$

9-9-84

overfall: 100 ft throat + open ridge 300 ft then onto next

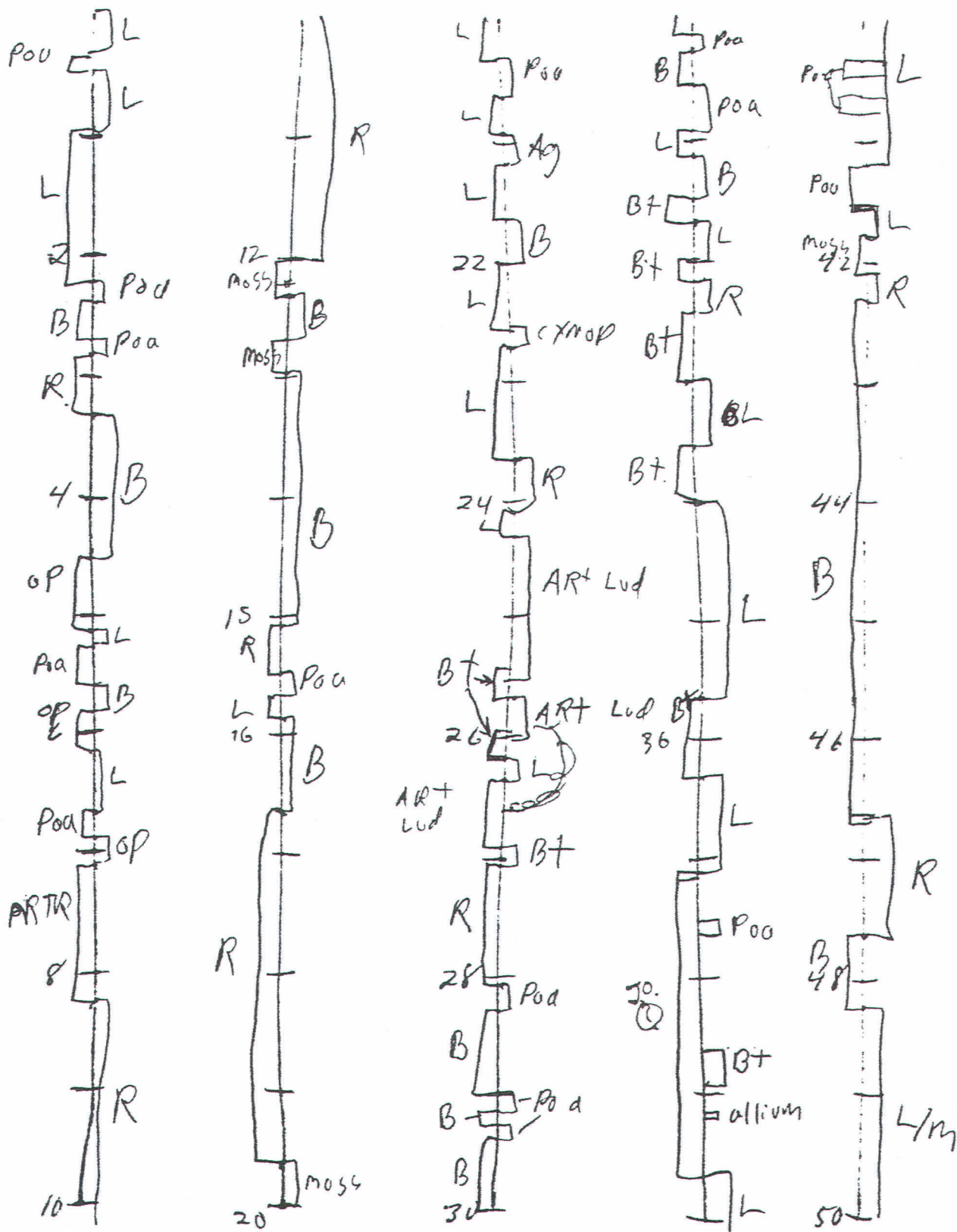
outside 50 m. E of Adk. track ~~is~~ ~~and~~ sand set on 90 m E
and 90

65
W

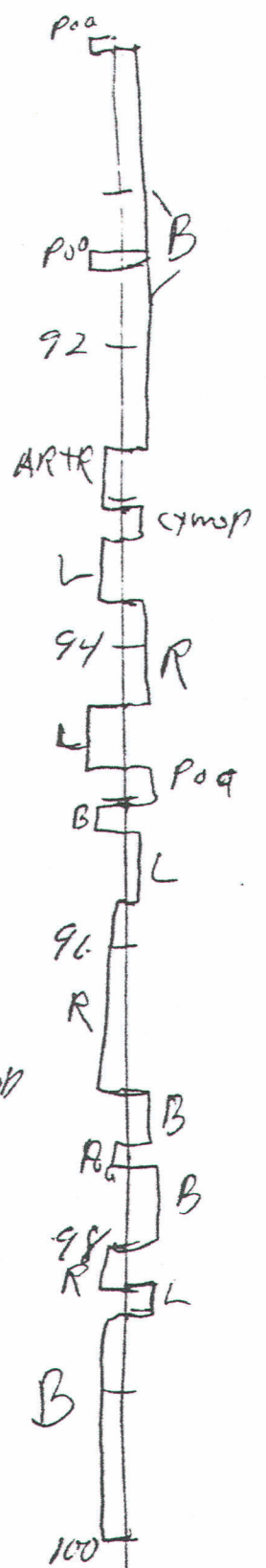
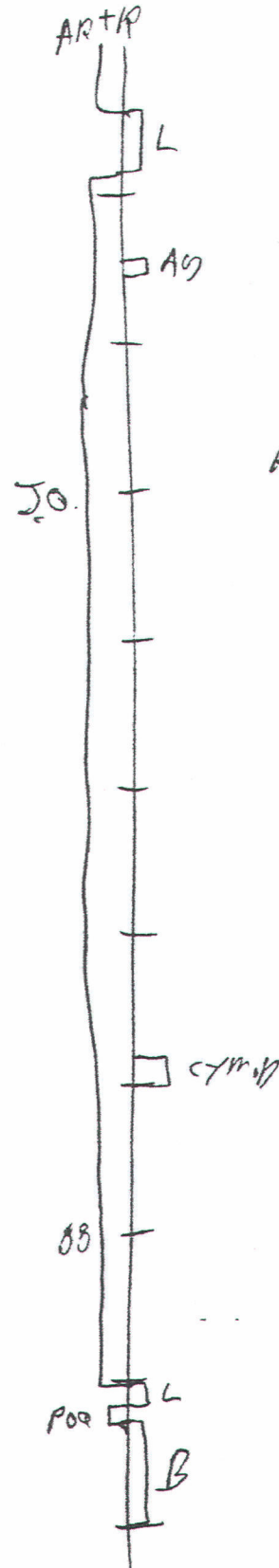
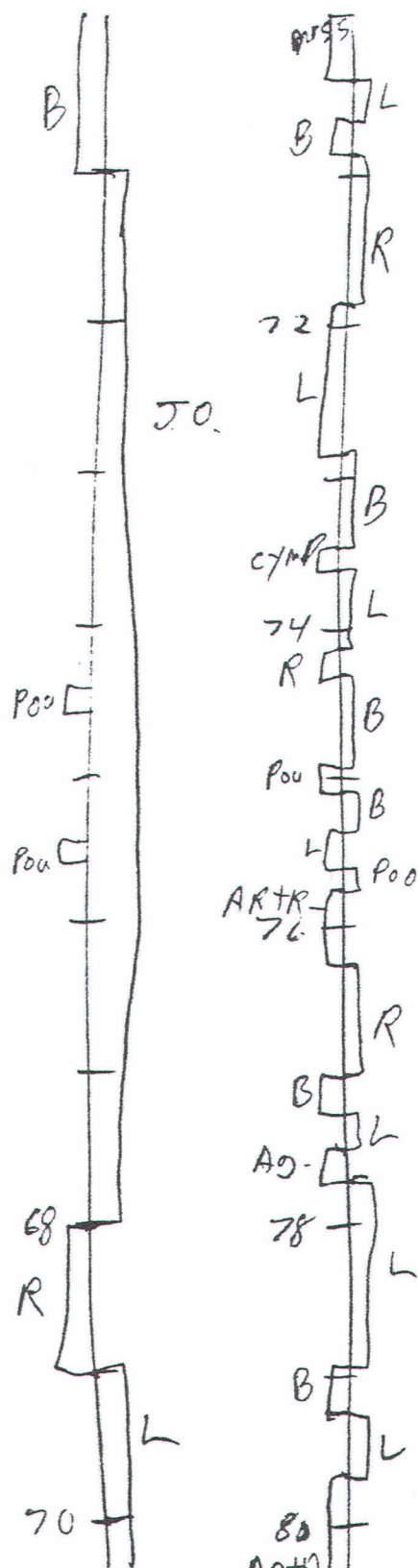
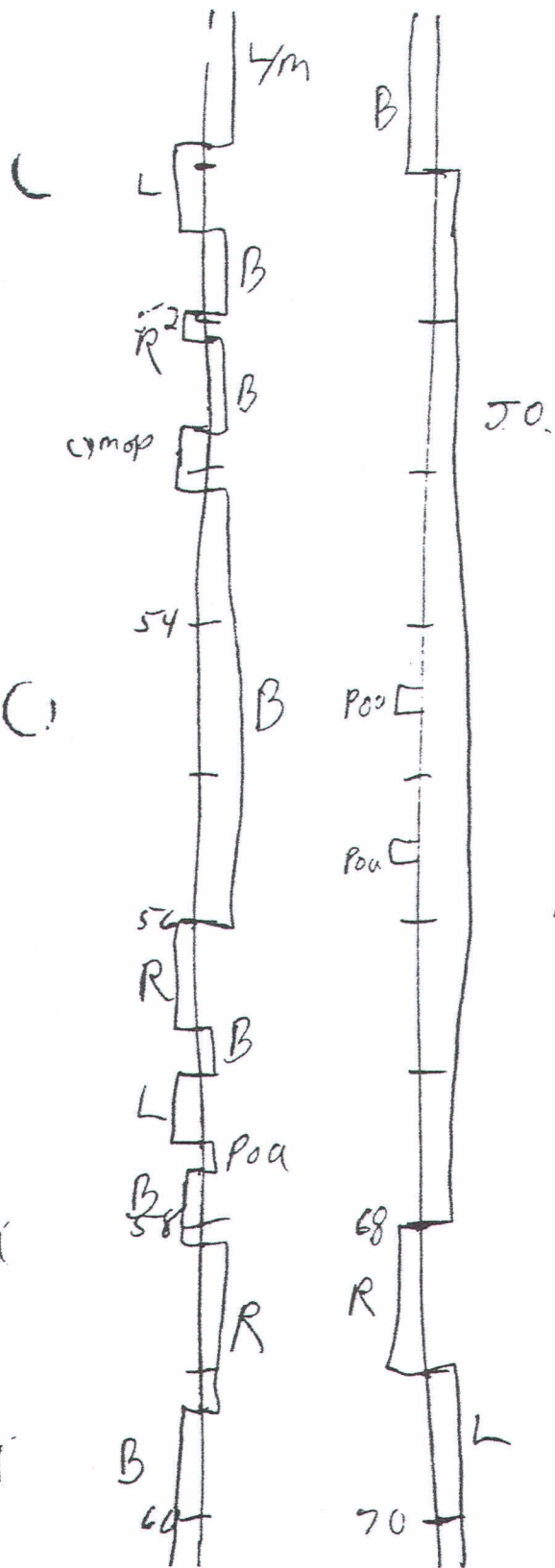


Line 5 (west)

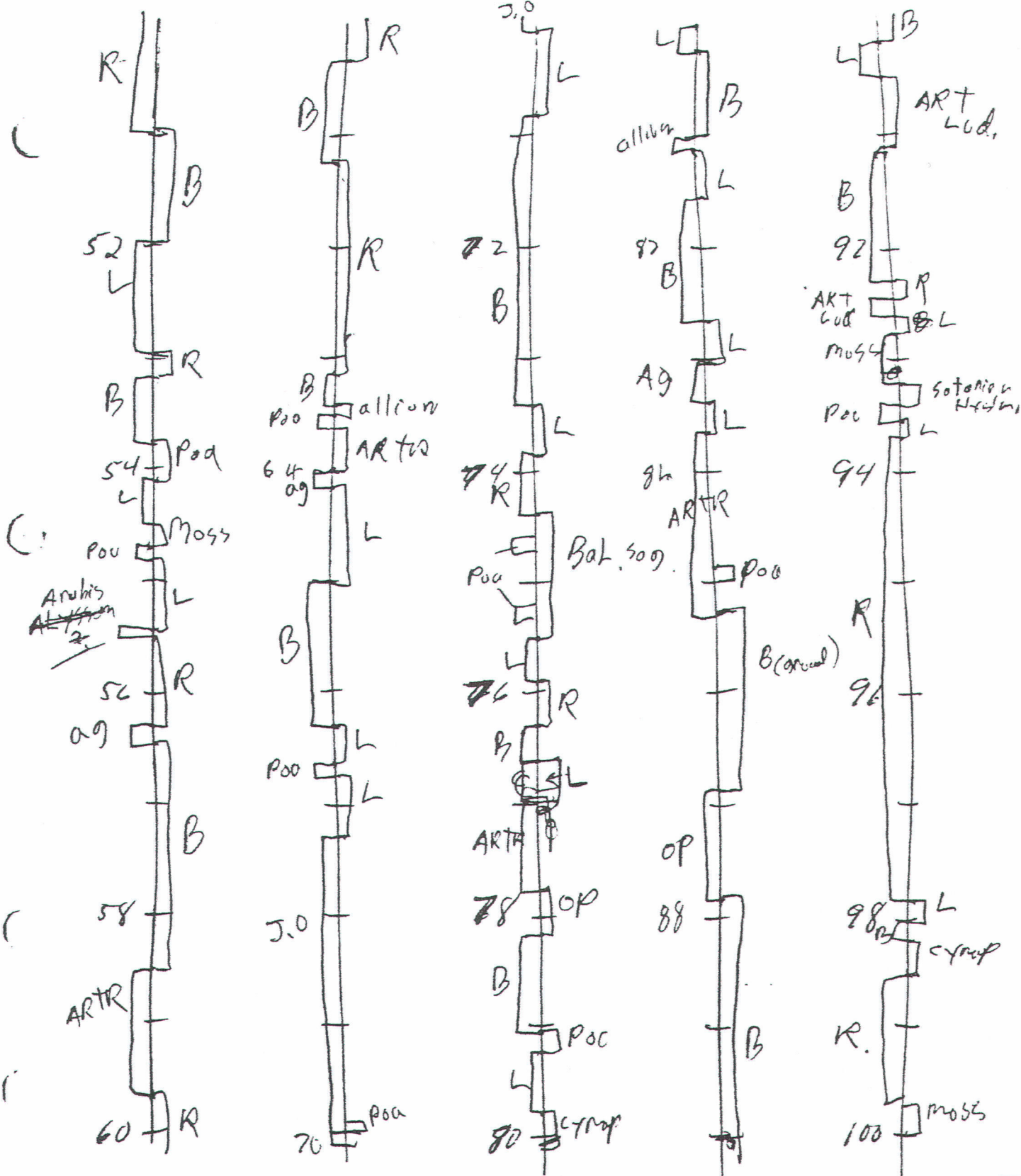
4-9-57



Line 5 west



Line 6 (wght)



Σ of occurrences at each Foot mark

Line	L	B	R	roa	agsac	cymop	OP	Allium	J.O	ARTR	BT	ARTL
Line 1 (top)								1				
(+) rot✓												
Σ line 1:	10	33	21	8	19	7	2	1	0			
Line 2 (East)												
100V												
Σ line 2:	18	19	12	3	1				42	2	3	
Line 3 (top)										1	1	1
(+) rot✓												
Σ line 3:	9	15	48	7	2	2	2		16	1	1	1
Line 4 (East)												
100V												
Σ line 4:	7	40	20	2	0				28	2	0	
Line 5 (West)					1	1						
(+) rot✓												
Σ line 5:	5	14	26	3	1	1	3	0	19	6	2	2
Line 6 (West)					1			1				
(+) rot✓												
Σ line 6:	12	33	31	5	1	2	3	1	3	6	1	1
Top line 13	19 1/2	48 1/2	69 1/2	15 1/2	2 1/2	9 1/2	4 1/2	1 1/2	16 1/2	1 1/2	1 1/2	1 1/2
East (line 24)	25 1/2	59 1/2	33 1/2	5 1/2	1 1/2	0 1/2	0 1/2	0 1/2	70 1/2	4 1/2	3 1/2	0 1/2

Exhibit 5

United States
Department of
Agriculture

Soil
Conservation
Service

7235 South 300 West
Midvale, Utah 84047

February 21, 1989

Glenn P. Jones, Manager
Mining and Properties
General Refractories Company
c/o The Lehi Plant
P. O. Box 127
Lehi, Utah 84043

Dear Mr. Jones:

This responds to your request for information to plan rehabilitation measures for your silicate mine located in parts of Sections 14 and 23, T4S, R6W, on the Hickman Bench in Tooele County, Utah.

We provided you with a soils map, soil descriptions, and a range site description at our meeting this morning in the Tooele SCS office. This letter provides the additional information you requested to interpret and use the maps and site descriptions.

The area being mined and the area planned to be mined is considered a rock outcrop inclusion in the soil designated UBF. It is called a Reywat, Broad, Rock Outcrop Soil Association. The Reywat soil is formed in residuum and colluvium derived dominantly from quartzite. The top soil is very cobbly loam to very gravelly clay loam down to bed rock at about 11 inches. Broad soil is gravelly loam to very cobbly loam 36 inches deep down to fractured quartzite bedrock.

The expected vegetation on the Reywat and Broad Soils is bluebunch wheatgrass, Indian rice grass, Asters cheatgrass, mustards, daisy, pussytoes, black sage, snakeweed, prickly pear and Utah Juniper. We have not made an on-site investigation, so these observations are general.

The rock outcrop, which is the material to be mined, has scattered patches of soil with limited vegetation growing in the patches. Since the area to be disturbed is primarily the rock outcrop itself it would be virtually impossible to stockpile any of the topsoil. The present erosion potential, and the erosion potential after mining is slight to negligible.

As we understand it, the mining process consists of clearing the scattered vegetation, drilling holes and blasting to shatter the rock material. The shattered rock material will then be screened to salvage rocks greater than 3 inches in diameter. All this material will be stockpiled and hauled to the refractory in Lehi, Utah. The material smaller than 3 inches will be returned to the pit area leaving a covering of porous material with very little potential for erosion.

The potential for success of any reseeding effort on the stockpiles or in the pit area is very poor and probably not needed. Normal construction procedures should be used for preventing erosion on haul roads and staging areas during mining operations. These might include graveling roads or sprinkling them.

I am informing the Tooele County Planner of our recommendations by providing him a copy of this letter and invite him to call if he has any comments and/or questions.

I have discussed the letter with Mr. Glenn Elkington, Chairman of the Grantsville Soil Conservation District Board and have also provided him a copy of the letter.

Please feel free to contact me if I can be of further assistance.

Sincerely,



JAMES D. MAXWELL
District Conservationist

cc: Joseph Urbanik, Tooele County Planner, Tooele, Ut
Glenn H. Elkington, Chairman, Grantsville SCD, Tooele, Ut



Online Services Agency List Business

Search

Utah Division of Water Rights



Select Related Information

(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 05/02/2016

WATER RIGHT: **15-4745** APPLICATION/CLAIM NO.: **A23378** CERT. NO.:
 CHANGES: a32416 (Filed: 01/30/2007) Approved

OWNERSHIP*****

NAME: Richard H. Butz and Sharon Taube
 ADDR: 2430 Summer Oak Circle
 Sandy, UT 84092

DATES, ETC.*****

LAND OWNED BY APPLICANT? COUNTY TAX ID#:
 FILED: 10/31/1951|PRIORITY: 05/14/1954|PUB BEGAN: 03/07/1952|PUB ENDED: |NEWSPAPER:
 ProtestEnd: |PROTESTED: [No] |HEARNG HLD: |SE ACTION: [Approved]|ActionDate:08/12/1952|PROOF DUE:
 EXTENSION: |ELEC/PROOF:[Election]|ELEC/PROOF:10/18/1976|CERT/WUC: 08/13/1987|LAP, ETC: |LAPS LETTER:
 RUSH LETTR: |RENOVATE: |RECON REQ: |TYPE: []
 PD BOOK: [15-]|MAP: []|PUB DATE:

*TYPE -- DOCUMENT -- STATUS--

Type of Right: Application to Appropriate Source of Info: Ownership Segregation Status: Water User's Claim

LOCATION OF WATER RIGHT** (Points of Diversion: Click on Location to access PLAT Program.) *****[MAP VIEW](#) *****

FLOW: 0.75 acre-feet
 SOURCE: Underground Water Well
 COUNTY: Tooele COMMON DESCRIPTION:

POINT OF DIVERSION -- UNDERGROUND: (Click Well ID# link for more well data.)

(1) N 76 ft W 48 ft from E4 cor, Sec 35, T 2S, R 5W, S1E6
 DIAMETER OF WELL: 10 ins. DEPTH: 650 to ft. YEAR DRILLED: 1982 WELL LOG? Yes [WELL ID#: 30139](#)
 (2) N 1275 ft W 623 ft from E4 cor, Sec 35, T 2S, R 5W, S1E6
 DIAMETER OF WELL: 12 ins. DEPTH: 300 to ft. YEAR DRILLED: 1961 WELL LOG? Yes [WELL ID#: 35336](#)

USES OF WATER RIGHT***** ELU -- Equivalent Livestock Unit (cow, horse, etc.) ***** EDU -- Equivalent Domestic Unit or 1 Family
 (The Beneficial Use Amount is the quantity of Use that this Water Right contributes to the Group Total.)

SUPPLEMENTAL GROUP NO.: 623799

IRRIGATION: 0.1875 acres

PERIOD OF USE: 04/01 TO 10/31

###PLACE OF USE: *-----NORTH WEST QUARTER-----*-----NORTH EAST QUARTER-----*-----SOUTH WEST QUARTER-----*-----SOUTH EAST QUARTER-----*
 * NW | NE | SW | SE * NW | NE | SW | SE * NW | NE | SW | SE * NW | NE | SW | SE *
Sec 35 T 2S R 5W S1E6 * | | | | * | | | | * | | | | * | | | | *

SEGREGATION HISTORY*****

This Right was Segregated from 15-360, with Appl#: A23378, Approval Date: / / under which Proof is to be submitted.
 This Right as originally filed:

FLOW IN CFS	QUANTITY IN ACRE-FEET	WATER USES						
		IRRIGATED ACREAGE	STOCK (ELUs)	DOMESTIC (FAMILIES)	MUNICIPAL	MINING	POWER ACRE-FEET	OTHER
	0.75	0.1875						

 *****END OF DATA*****

Fig 7-1

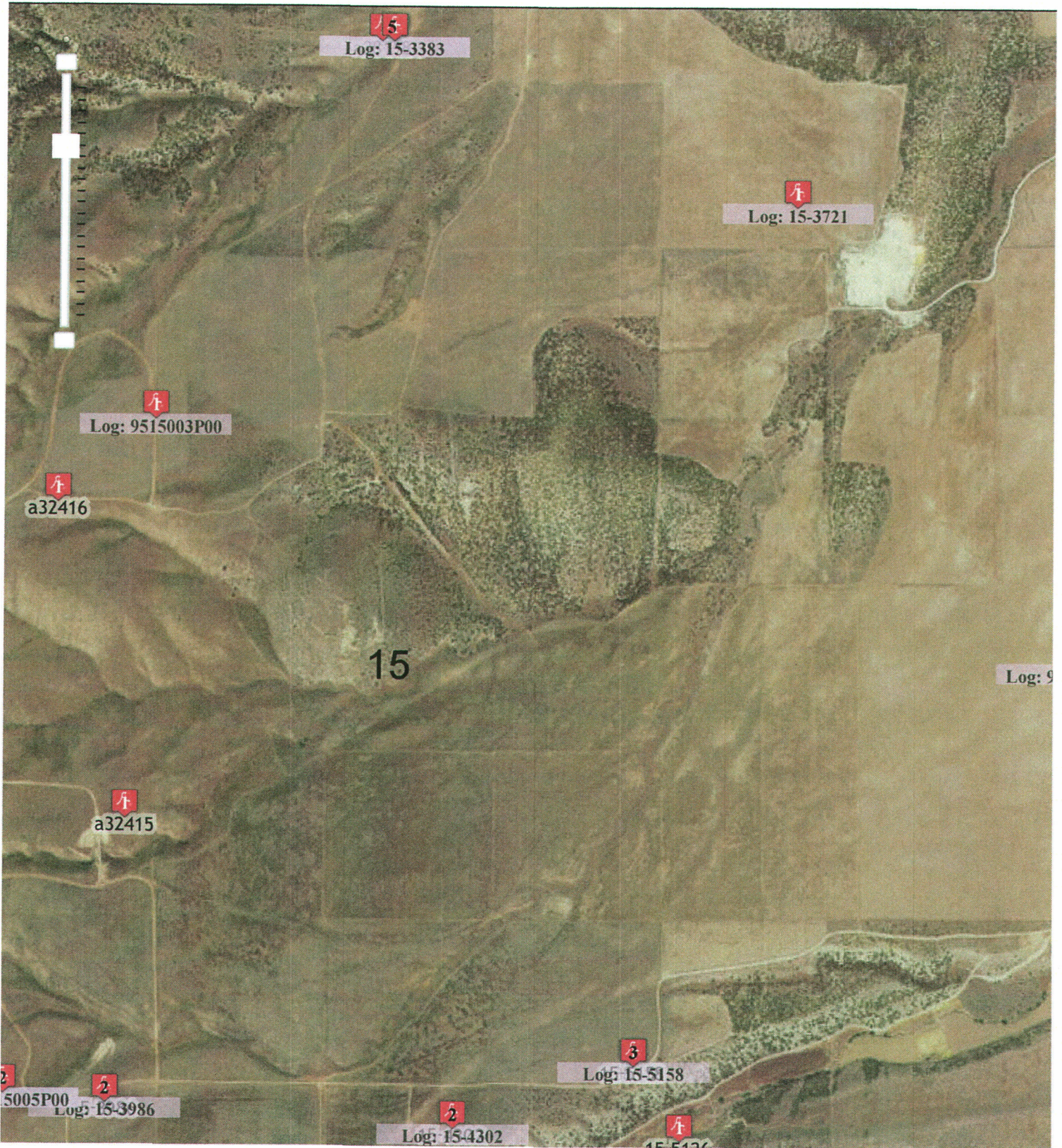


FIG 7-2

0 0.1 0.2 mi



Online Services Agency List Business

Search



Utah Division of Water Rights

Select Related Information

(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 04/28/2016

WATER RIGHT: **15-2833** APPLICATION/CLAIM NO.: **A54518** CERT. NO.: CERTIFICAT
 CHANGES: a32988 (Filed: 05/18/2007) Approved

OWNERSHIP*****

NAME: George Fidler
 ADDR: 4620 South 600 East
 Salt Lake City UT 84107
 INTEREST: 100%

DATES, ETC.*****

LAND OWNED BY APPLICANT? No COUNTY TAX ID#:
 FILED: 04/21/1980|PRIORITY: 05/29/1980|PUB BEGAN: 05/29/1980|PUB ENDED: [NEWSPAPER: Tooele Transcript - Bulletin
 ProtestEnd:07/12/1980|PROTESTED: [No]|HEARNG HLD: [SE ACTION: [Approved]|ActionDate:07/31/1980|PROOF DUE: 07/31/1994
 EXTENSION: [ELEC/PROOF:[Proof]|ELEC/PROOF:08/01/1994|CERT/WUC: 07/19/1996|LAP, ETC: [LAPS LETTER:
 RUSH LETTR: [RENOVATE: [RECON REQ: [TYPE: []
 PD BOOK: [15-]|MAP: []|PUB DATE:
 *TYPE -- DOCUMENT -- STATUS--

Type of Right: Application to Appropriate Source of Info: Certificate Status: Certificate

LOCATION OF WATER RIGHT***(Points of Diversion: Click on Location to access PLAT Program.)*****[MAP VIEW](#) *****

FLOW: 0.015 cfs OR 1.506 acre-feet
 SOURCE: Underground Water Well
 COUNTY: Tooele COMMON DESCRIPTION:

POINT OF DIVERSION -- UNDERGROUND: (Click Well ID# link for more well data.)

(1) N 131 ft E 655 ft from SW cor, Sec 09, T 3S, R 5W, SLBM
 DIAMETER OF WELL: 6 ins. DEPTH: 210 to ft. YEAR DRILLED: 1982 WELL LOG? Yes [WELL ID#: 12619](#)

USES OF WATER RIGHT***** ELU -- Equivalent Livestock Unit (cow, horse, etc.) ***** EDU -- Equivalent Domestic Unit or 1 Family
 (The Beneficial Use Amount is the quantity of Use that this Water Right contributes to the Group Total.)

SUPPLEMENTAL GROUP NO.: 9499

IRRIGATION: 0.25 acres PERIOD OF USE: 04/01 TO 10/31

STOCKWATER: 2.0000 Stock Units PERIOD OF USE: 01/01 TO 12/31

DOMESTIC: 1.0000 EDUs PERIOD OF USE: 01/01 TO 12/31

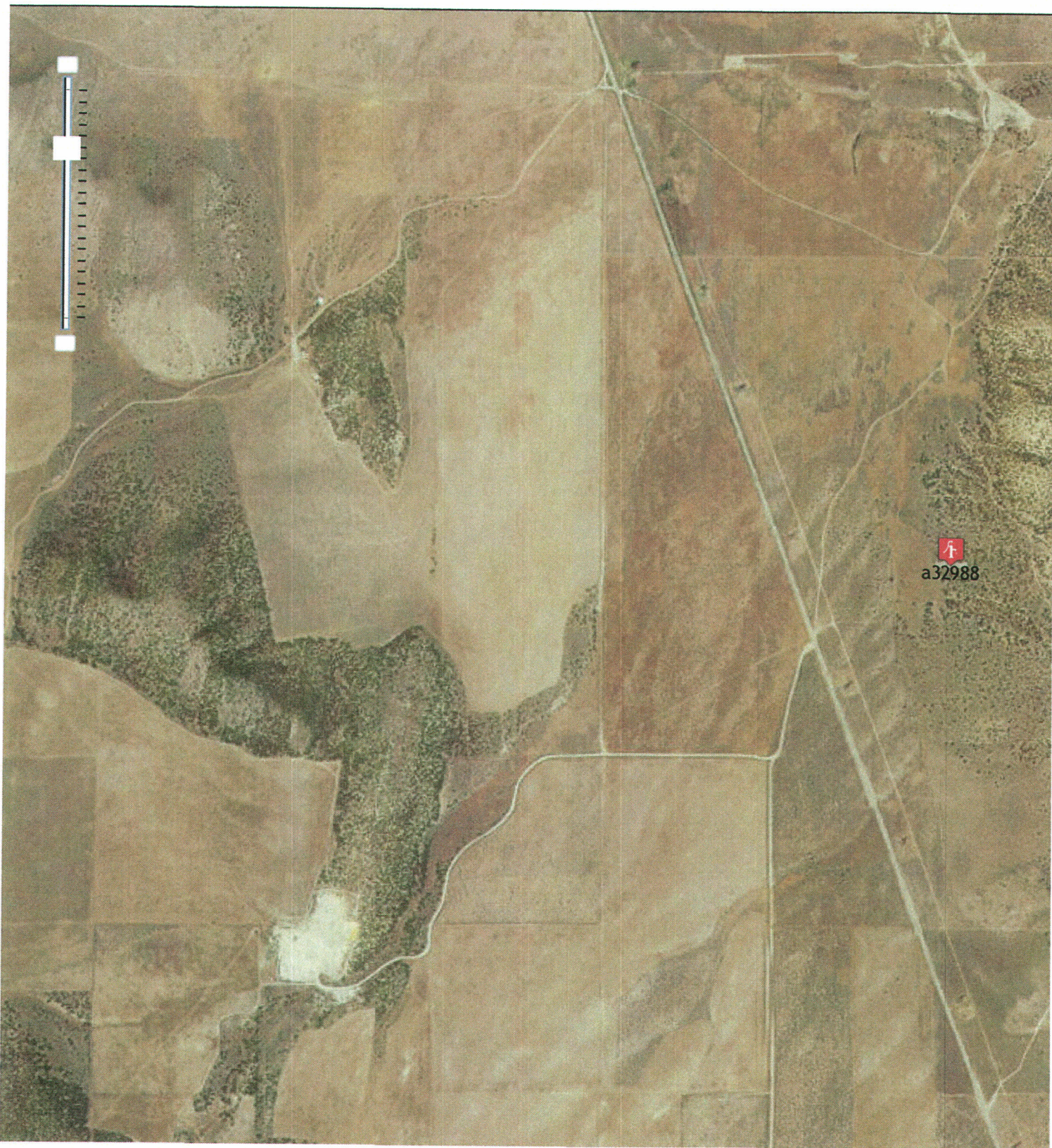
###PLACE OF USE: *-----NORTH WEST QUARTER-----*-----NORTH EAST QUARTER-----*-----SOUTH WEST QUARTER-----*-----SOUTH EAST QUARTER-----*
 * NW | NE | SW | SE * NW | NE | SW | SE * NW | NE | SW | SE * NW | NE | SW | SE *
Sec 09 T 3S R 5W SLBM * | | | | * | | | | * | | | | * | | | | * | | | | *
 0.2500 | * | | | | * | | | | * | | | | * | | | | * | | | | *
 GROU

PLACE OF USE for STOCKWATERING*****

	NORTH-WEST¼	NORTH-EAST¼	SOUTH-WEST¼	SOUTH-EAST¼
	NW NE SW SE	NW NE SW SE	NW NE SW SE	NW NE SW SE
Sec 09 T 3S R 5W SLBM	* : : : *	* : : : *	* : : X: *	* : : : *

 *****E N D O F D A T A*****

FIG-7-3



F19-7-4

0 0.1 0.2mi

Utah Division of Water Rights



Select Related Information

(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 05/02/2016

The Paper Fileroom File for this Water Right has been DESTROYED!!!

WATER RIGHT: **15-3721** APPLICATION/CLAIM NO.: **A69548** CERT. NO.:
CHANGES: a21902 (Filed: 02/09/1998) Withdrawn
a22158 (Filed: 04/24/1998) Lapsed

OWNERSHIP*****

NAME: Kristi Johnson
ADDR: P.O. Box 1311
Granstville UT 84029
INTEREST: 100%

DATES, ETC.*****

LAND OWNED BY APPLICANT? Yes		COUNTY TAX ID#:	
FILED:	12/14/1995 PRIORITY: 12/14/1995	PUB BEGAN:	PUB ENDED:
ProtestEnd:	PROTESTED: [No	HEARING HLD:	NEWSPAPER:
EXTENSION:	ELEC/PROOF: [ELEC/PROOF:	SE ACTION: [Approved] ActionDate:04/10/1996 PROOF DUE:
RUSH LETTR:06/03/1998 RENOVATE:	RECON REQ:	CERT/WUC:	LAP, ETC: 04/30/2004 LAPS LETTER:
PD BOOK: [15-	MAP: [PUB DATE:	TYPE: []

*TYPE -- DOCUMENT -- STATUS.

Type of Right: Application to Appropriate	Source of Info: Application to Appropriate	Status: Lapsed
---	--	-----------------------

LOCATION OF WATER RIGHT*** (Points of Diversion: Click on Location to access PLAT Program.)*****[MAP VIEW](#)*****

FLOW: 1.73 acre-feet
SOURCE: Underground Water Well
COUNTY: Tooele COMMON DESCRIPTION: Grantsville

POINT OF DIVERSION -- UNDERGROUND: (Click Well ID# link for more well data.)

(1) N 400 ft W 200 ft from SE cor. Sec 15, T 4S, R 6W, SLBM

DIAMETER OF WELL: 6 ins. DEPTH: 100 to 500 ft. YEAR DRILLED: WELL LOG? No WELL ID#: 20380

USES OF WATER RIGHT***** ELU -- Equivalent Livestock Unit (cow, horse, etc.) ***** EDU -- Equivalent Domestic Unit or 1 Family
(The Beneficial Use Amount is the quantity of Use that this Water Right contributes to the Group Total.)

SUPPLEMENTAL GROUP NO.: 10405.

IRRIGATION: 0.25 acres

STOCKWATER: 10.0000 Stock Units

DOMESTIC: 1.0000 EDUs PERIOD OF USE: 01/01 TO 12/31

###PLACE OF USE: *-----NORTH WEST QUARTER-----*-----NORTH EAST QUARTER-----*-----SOUTH WEST QUARTER-----*-----SOUTH EAST QUARTER-----
 * NW NE SW SE * NW NE SW SE * NW NE SW SE * NW NE SW SE * NW NE SW SE
Sec 12 T 4S R 6W S1BM * _____|_____|_____|_____ * _____|_____|_____|_____ * _____|_____|X|_____ * _____|_____|_____|_____ GROT

PLACE OF USE for STOCKWATERING*****

				NORTH-WEST ⁴				NORTH-EAST ⁴				SOUTH-WEST ⁴				SOUTH-EAST ⁴					
				NW NE SW SE				NW NE SW SE				NW NE SW SE				NW NE SW SE					
Sec 12	T	4S	R	6W	SLBM	*	:	:	:	*	:	:	:	*	:	:	:	*	:	:	:

DIVERSION & DEPLETION ESTIMATES*****

(All values in acre-feet, Growing Season in days)

MANUALLY ACRE-FEET DIVERSION DEPLETION GROWING WATER-USE

IRRIGATION	STOCK	DOMESTIC	MUNICIPAL	MINING	POWER	OTHER	EVALUATED	EXPORTED	DUTY	DUTY	SEASON REPORTING
------------	-------	----------	-----------	--------	-------	-------	-----------	----------	------	------	------------------

DIV: Yes

DEP:

APPLICATIONS FOR EXTENSIONS OF TIME WITHIN WHICH TO SUBMIT PROOF*****

FILED: 10/25/2001 | PUB BEGAN: | PUB ENDED: | NEWSPAPER:
ProtestEnd: | PROTESTED: [No] | HEARNG HLD: | SE ACTION: [Approved] | ActionDate: 01/24/2002 | PROOF DUE: 04/30/2004

FILED: 04/26/2004 | PUB BEGAN: | PUB ENDED: | NEWSPAPER: No Adv Required
ProtestEnd: | PROTESTED: [No] | HEARING HLD: | SE ACTION: [Rejected] | ActionDate: 06/10/2004 | PROOF DUE:

*****END OF DATA*****



FIG 7-6
0 300 600ft

Utah Division of Water Rights

Select Related Information

(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 04/28/2016

WATER RIGHT: **15-3471** APPLICATION/CLAIM NO.: **A67927** CERT. NO.: CERTIFICAT

OWNERSHIP*****

NAME: Larry C. Burton
ADDR: P.O. Box 756
Grantsville UT 84029

DATES, ETC.*****

LAND OWNED BY APPLICANT? No COUNTY TAX ID#:
FILED: 06/28/1994|PRIORITY: 06/28/1994|PUB BEGAN: 07/21/1994|PUB ENDED: |NEWSPAPER: Tooele Transcript - Bulletin
ProtestEnd:09/03/1994|PROTESTED: [No]|HEARING HLD: |SE ACTION: [Approved]|ActionDate:09/30/1994|PROOF DUE: 10/31/2000
EXTENSION: |ELEC/PROOF:[Proof]|ELEC/PROOF:10/31/2000|CERT/WUC: 04/18/2003|LAP, ETC: |LAPS LETTER:
RUSH LETTR: |RENOVATE: |RECON REQ: |TYPE: []
PD BOOK: [15-]|MAP: []|PUB DATE:

```
*TYPE -- DOCUMENT -- STATUS-----*
```

LOCATION OF WATER RIGHT** (Points of Diversion: Click on Location to access PLAT Program.) *****[MAP VIEW](#) *****

FLOW: 21.0 acre-feet
SOURCE: Underground Water Well
COUNTY: Tooele COMMON DESCRIPTION: 7 miles West of Stockton

POINT OF DIVERSION -- UNDERGROUND: (Click Well ID# link for more well data.)

DIAMETER OF WELL: 8 ins. DEPTH: 502 to ft. YEAR DRILLED: 1996 WELL LOG? Yes WELL ID#: 10419

USES OF WATER RIGHT***** ELU -- Equivalent Livestock Unit (cow, horse, etc.) ***** EDU -- Equivalent Domestic Unit or 1 Family
(The Beneficial Use Amount is the quantity of Use that this Water Right contributes to the Group Total.)

SUPPLEMENTAL GROUP NO.: 10137.

IRRIGATION: 5.0 acres

STOCKWATER: 2.0000 Stock Units

DOMESTIC: 1.0000 EDUs

[illegible]

PLACE OF USE for STOCKWATERING*****

				NORTH-WEST ^{1/4}				NORTH-EAST ^{1/4}				SOUTH-WEST ^{1/4}				SOUTH-EAST ^{1/4}					
				NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE		
Sec 23	T	4S	R	6W	SLBM	*	:	:	:	*	:	:	:	*	:	:	:	*	:	:	*

Storage from 01/01 to 12/31, inclusive, in Unnamed Pond with a maximum capacity of 0.430 acre-feet, located in:

Height of Dam:		NORTH-WEST ⁴		NORTH-EAST ⁴		SOUTH-WEST ⁴		SOUTH-EAST ⁴
Area Inundated:	0.26	NW NE SW SE		NW NE SW SE		NW NE SW SE		NW NE SW SE
Sec 23 T 48 R 6W SLBM		* : : : *		* : : : *		* : : : *		* : : : *

Small Dam Required?: No

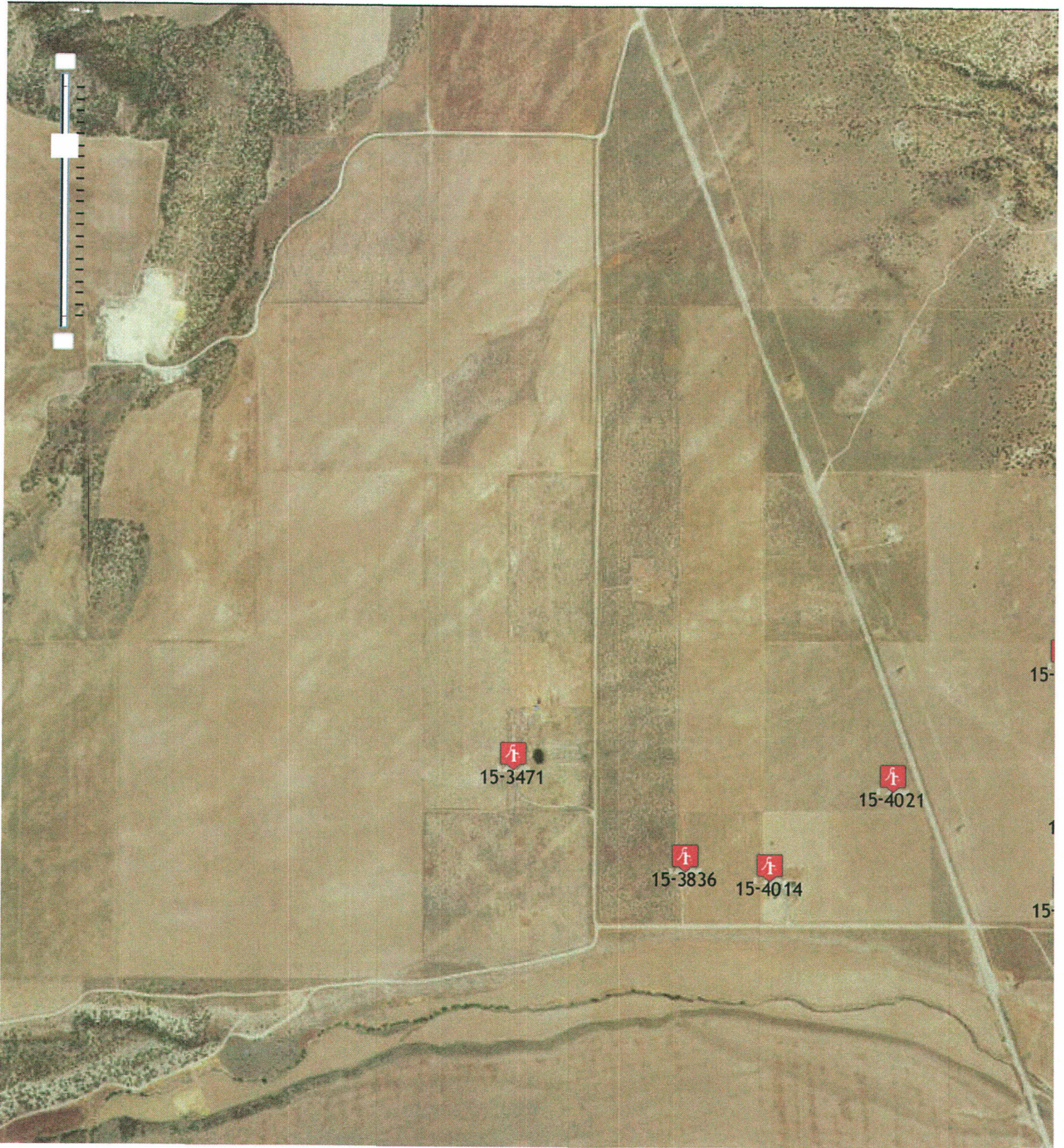
OTHER COMMENTS*****

Total quantity of water includes pond filling and evaporation calculated by data from 'Consumptive Use of Irrigated Crops in Utah' Research Report 145, for the NWS, Station at Tooele.

APPLICATIONS FOR EXTENSIONS OF TIME WITHIN WHICH TO SUBMIT PROOF*****

FILED:	10/13/1999	PUB BEGAN:		PUB ENDED:		NEWSPAPER:	
ProtestEnd:		PROTESTED: [No]	HEARNG HLD:		SE ACTION: [Approved]	ActionDate:01/11/2000 PROOF DUE: 10/31/2000

*****END OF DATA*****



F19 7-8

0 0.1 0.2 mi

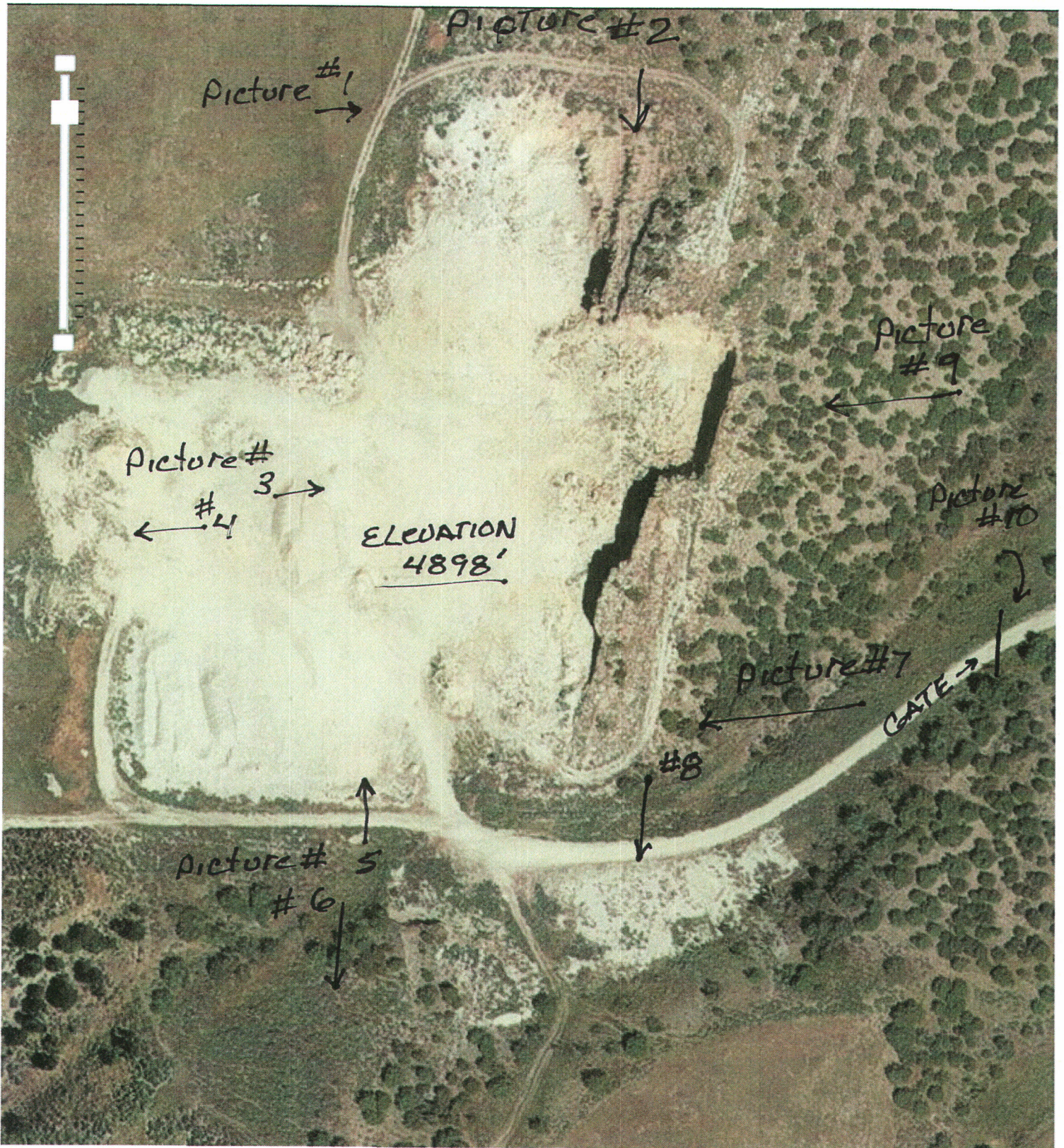


FIG 10

0 100 200ft

#1

#1



F1910-1

#2

#2



F19 10-2

#3

#3



Fig 10-3

#4

#4



F19 10-4

H 5

5



F19 10.5

H6

#6



F1910-C

#7

#7



Fig. 10-7

#8

#8



P1910-8

#9



F19 10-9

#10

#10



Fig 10-10

R647-4-112 Variance

Application for variance was applied for (see original file) (1980)

R647-4-113 Surety

Direct costs

1. Demolition and removal of structures	0.00
2. Backfilling, grading, and contouring	8,000.00
3. Revegetation (preparation, seeding	2,500.00
4. Subtotal Direct Cost	10,500.00

Indirect Costs

5. Mob/Demob	0.00
6. Contingency	1,500.00
7. Engineering Redesign	0.00
8. Main Office Expense	0.00
9. Project Management Fee	0.00
10. Subtotal Indirect costs	1,500.00
11. Total Cost 2015	12,000.00
12. Number of years	5
13. Escalation (factor 0.012)	144.00
14. Reclamation Cost Escalated	1,644.00
15. Per Acre Cost	2,400.00

References

Utah Division of Water Rights, 2016 Water Right Record information. Available online at: <http://maps.waterrights.utah.gov/EsriMap/map> Accessed May 2016

Utah Conservation Data Center 2016. Sensitive Species List by County. Available on line at: <http://dwr cds.nr.utah.gov/ucdc/ViewReports/sscounty.htm> Accessed May 2016

Tooele County Online Public Record Search. Available on line at: <http://geodata.tooelecountyonline.org>

References

Utah Division of Water Rights, 2016 Water Right Record information. Available online at: <http://maps.waterrights.utah.gov/EsriMap/map> Accessed May 2016

Utah Conservation Data Center 2016. Sensitive Species List by County. Available on line at: <http://dwr cds.nr.utah.gov/ucdc/ViewReports/sscounty.htm> Accessed May 2016

Tooele County Online Public Record Search. Available on line at: <http://geodata.tooelecountyonline.org>